CANADA

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

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20-12-13
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NATIONAL MUSEUM OF CANADA
BULLETIN No. 140

# FLORA OF MANITOBA

By
H. J. Scoggan

1957

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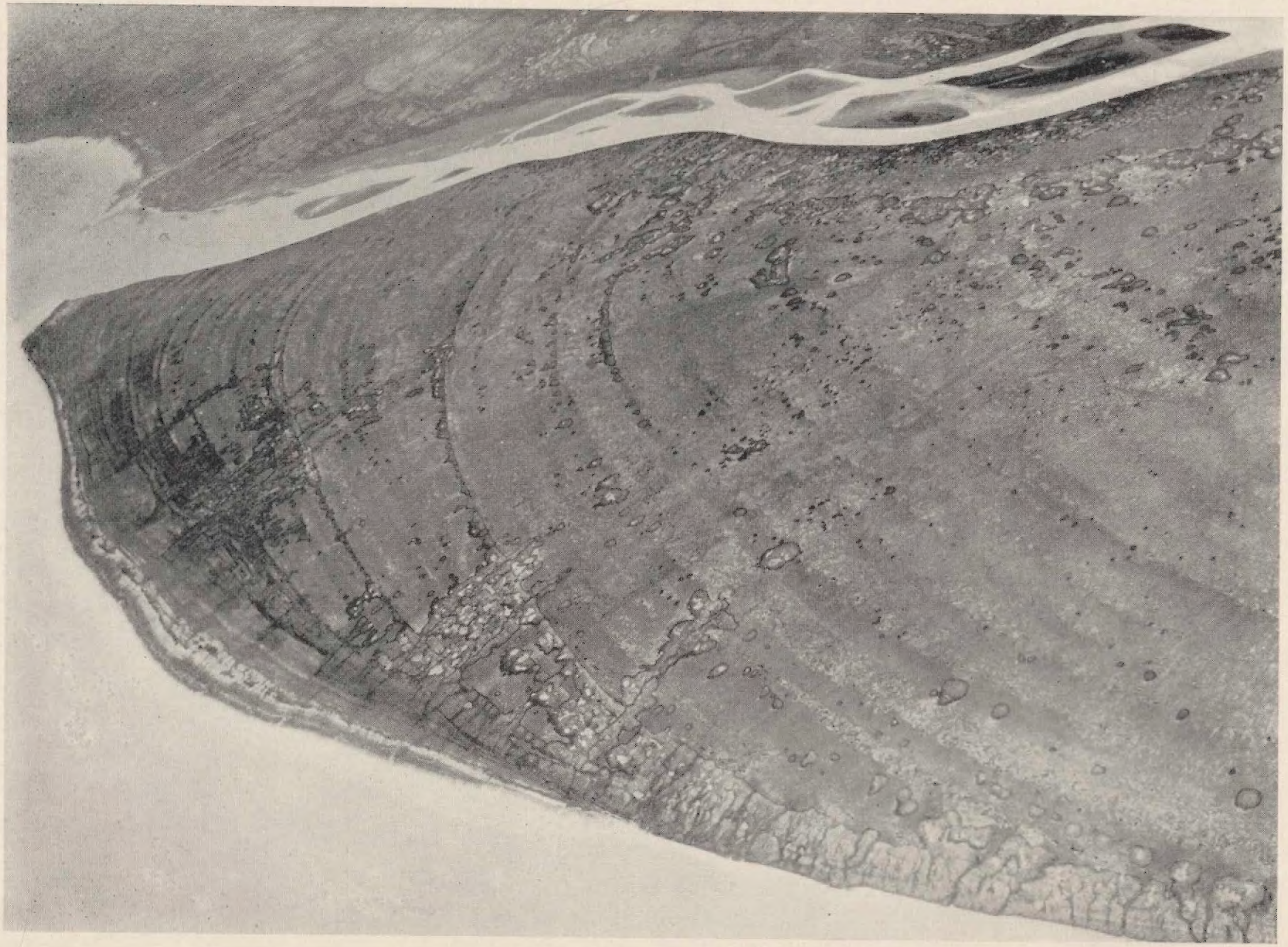
PLATE I



Marsh (Beacon) Point, separating the estuaries of the Hayes and Nelson rivers,
showing the concentric pattern of raised shore lines

CANADA
DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

NATIONAL MUSEUM OF CANADA

# FLORA OF MANITOBA

BY
H. J. Scoggan

## BULLETIN No. 140

BIOLOGICAL SERIES No. 47

Issued under the authority of
The Minister of Northern Affairs and National Resources
Ottawa 1957

*Price: $5.00*

66906—1

## FOREWORD

Manitoba is at present the only Canadian province not included in the areas covered by three of the four manuals now in general use dealing with the ferns and flowering plants of temperate North America. Rydberg's "Flora of the Rocky Mountains and Adjacent Plains" takes Saskatchewan as its eastern limit. Fernald's "Gray's Manual of Botany" and Gleason's "New Britton and Brown Illustrated Flora" both take Ontario as their western limit. Only a very small part of the total area of Manitoba, the southwestern prairie region, is included in the range of Rydberg's now somewhat outdated "Flora of the Prairies and Plains of Central North America".

Because of the past relatively meagre knowledge of the flora of Manitoba, particularly of the central and northern regions, the province has all too often formed a large gap in the maps and citations of distribution presented in most taxonomic and phytogeographic papers and monographs. The fact is that Manitoba occupies a unique position as the central area of Canada toward which a great number of plant species from the four main points of the compass converge. Its floristic areas include extensions of the western and southern Grassland Region, the eastern Great Lakes – St. Lawrence Forest Region, and the northern Tundra – Forest and Tundra Regions.

The present work is a contribution not only to a fuller knowledge of this botanically much neglected province, but to a trend already in evidence, namely, the production of provincial Floras as the foundation for a future "Flora of Canada".

F. J. ALCOCK,
*Chief Curator.*

OTTAWA, November 4, 1955.

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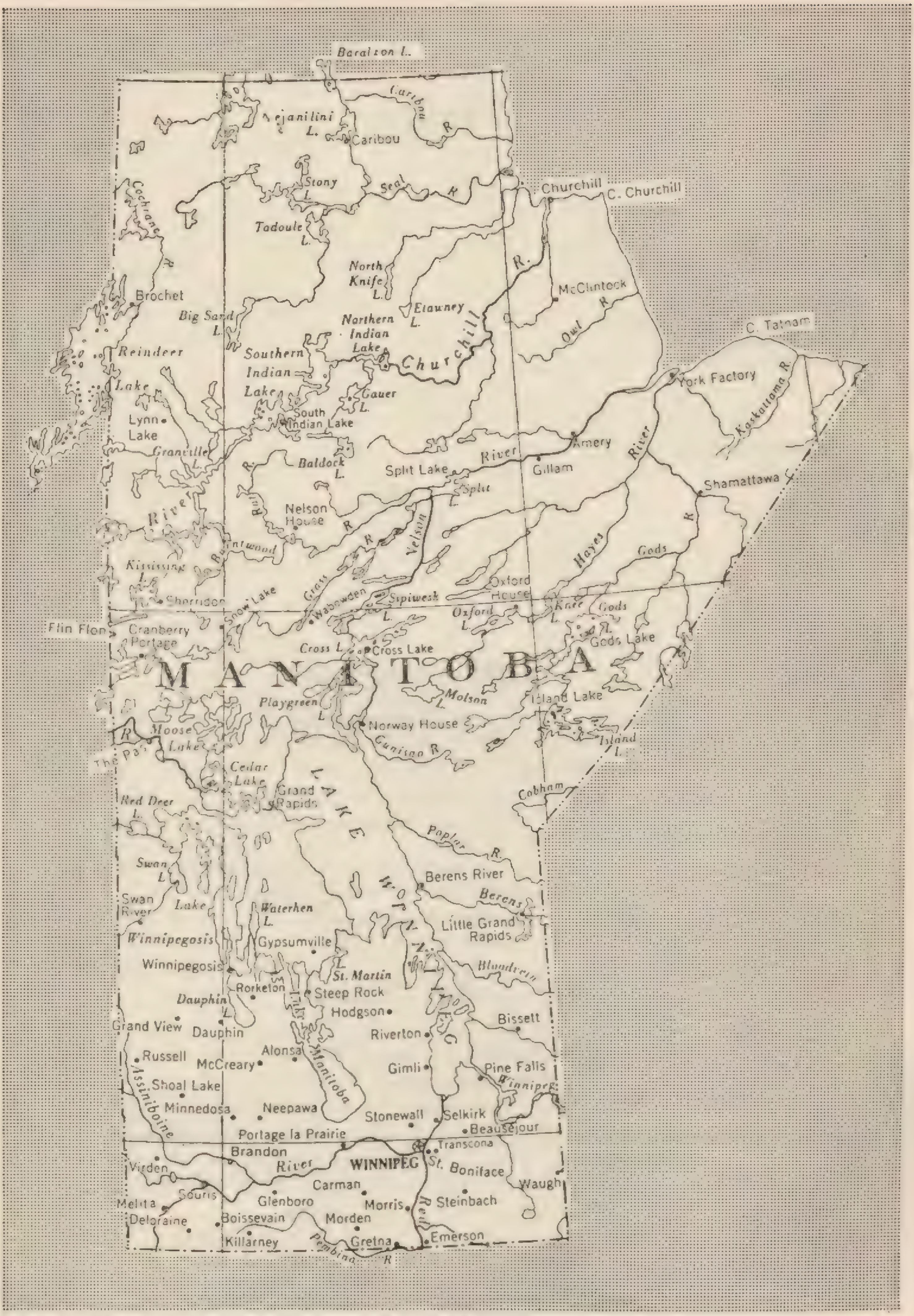

FIGURE 1. Map of Manitoba

# THE FLORA OF MANITOBA

## INTRODUCTION

The earliest published account bearing on the flora of Manitoba appears to be Franklin's "Narrative of a Journey to the Shores of the Polar Sea, in the Years 1819, 20, 21, and 22", dated 1823 at London, and containing a botanical appendix, by John Richardson, including plants found in the "... country about York Factory, which includes a small portion of the sea-shore of Hudson's Bay, and the lower part of Hayes' River". W. J. Hooker's "Flora Boreali Americana" [1829–40] is based largely upon the botanical results of Franklin's expeditions but also cites many collections made by Douglas in southern Manitoba. John Rae's "Narrative of an Expedition to the Shores of the Polar Sea", published at London in 1850, includes lists of plants found between York Factory and Churchill.

The inception of Manitoba floristics in the Hudson Bay region of the province is readily explained when attention is directed to the important role played by Churchill, Port Nelson, and York Factory (the latter the oldest permanent settlement in Manitoba) as gateways during the earliest days of colonization. An outline has already been given by the writer [Scoggan, 1951] of the development of the Hayes River system as the first great trade route into the interior following the incorporation of the Hudson's Bay Company in 1670, and the establishment of York Factory in 1684, as its main supply centre in the fur trade. It was not, however, until 1774 that the first inland station, Cumberland House, was established in present-day central Saskatchewan, in answer to the growing opposition of rival fur traders from Lower Canada. The opening of this and other posts in the interior paved the way for eventual colonization, and in 1811 Lord Selkirk was granted an area of about 116,000 square miles in present-day Manitoba, Saskatchewan, North Dakota, and Minnesota for the settlement of a group of emigrants from Ireland and Scotland, with the stipulation that he should furnish annually for ten years 200 employees for service in the Company. The main band of newcomers arrived the following year and travelled up the Hayes to Lake Winnipeg, thence to the Red River, and up that river to the site chosen for the historical Red River Settlement, south of present-day Winnipeg.

The earliest extensive report on the flora of southern Manitoba is that of E. Bourgeau [in Palliser, 1863], who listed the plants collected between Lake Superior and the Pacific Ocean during John Palliser's expedition in British North America in the years 1857–60. This was followed, in 1875, by G. M. Dawson's "List of Plants collected during the Summers of 1873–74, in the vicinity of the Forty-ninth Parallel—Lake of the Woods to the Rocky Mountains", included as an appendix to his report to the British North American Boundary Commission on the "Geology and Resources of the Region in the Vicinity of the Forty-ninth Parallel, from the Lake of the Woods to the Rocky Mountains".

Many of these early collections, including those of Robert Bell [1880, 1881, 1884], whose reports on the country between Lake Winnipeg and Hudson Bay include lists of the plants brought back, are cited in the "Catalogue of Canadian Plants" compiled by John Macoun [1883–1890]. The elder Macoun (1831–1920), with his son, James, collected extensively in the southern third of the province during the latter part of the nineteenth century, and also, with Wm. Herriot, along the line of the old Grand Trunk Pacific Railway, in 1906. He was the founder of the National Herbarium of Canada, being appointed in 1882 to the Geological Survey of Canada as its first botanist. His remarkably detailed and enthusiastically written book, "Manitoba and the Great North-west," published in 1882, did much to counteract the doubts expressed by Palliser as to the suitability of the Canadian prairies for settlement, and was a contributing factor in the final decision of the Government to build a railway through that region to the Rocky Mountains. James M. Macoun (1862–1920) was appointed Assistant Naturalist in the Geological Survey in 1898, Botanist in 1917, and Chief of the Biological Division in 1918. In addition to his early field-work in southern Manitoba, he made an extensive collection of the Churchill flora in 1910. His "Contributions to Canadian Botany" [1894–1906] contain many citations of Manitoba specimens.

Other nineteenth century contributors to Manitoba botany include John C. Schultz [1861], R. M. Christy [1887; "Notes on the Botany of Southern Manitoba"] and J. B. Tyrrell [1897], who included in an appendix the citation of a number of plants collected at Churchill by Miss Marjorie Lofthouse.

## TWENTIETH CENTURY CONTRIBUTIONS

The earliest check-list of the vascular plants of Manitoba is that of Burman [1910], which was prepared in 1909 for the 79th annual meeting of the British Association for the Advancement of Science and listed 702 species. The northern boundary of the province at that date was still fixed at lat. 52° 20′ N. but was extended to the present lat. 60° 00′ N. in 1912.

The second check-list is that of Jackson *et al.* [1922], which lists 1,024 species, for many of which citations of locality were given. This list was enlarged to a total of 1,160 species in the mimeographed revision prepared by Jackson, with the note "Corrected to Dec. 1924".

The next, and most recent, check-list is that of Lowe [1943], which lists about 1,500 species, many of which, however, are reduced to synonymy in the present work. Citations of locality are given for most species, but a considerable number are either unsupported by existing specimens or were included merely upon the basis of their having been assigned to the province in the ranges given in current manuals.

Other publications relating to the floristics and vegetation of southern Manitoba are those of Fletcher [1900], Bird [1927, 1930], Criddle [1927], Shimek [1927], Halliday [1935], Groh [1944, 1946, 1947], Groh and Frankton [1948, 1949], Scoggan [1952, 1953], and A. and D. Löve [1954]. Publications dealing with the floristics and vegetation of the central and northern parts of the province, particularly the Churchill area, include those of Preble [1902], Alcock [1916], Lowe [1920], Güssow [1933], Johansen [1933], Størmer [1933], Gröntved [1936], Gardner [1937], Shelford and Twomey [1941], McClure [1943], Beckett [1945], Radforth [1950], Scoggan [1950, 1951, 1952], and Baldwin [1953]. In giving the "first report" for Manitoba throughout the systematic treatment of the present work, reference is made to the foregoing publications, as well as to numerous monographic and shorter papers, these last either forming part of the bibliography or, when treating chiefly of single species, being cited under the species concerned.

## SCOPE OF THE FLORA

The present work includes as members of the flora of Manitoba all species and reasonably well-marked varieties, native or introduced, at present known to occur within the provincial boundaries. Keys are provided for the determination of families, genera, species, and varieties. Those for the last two categories are often quite artificial, the aim being to focus attention upon the most striking and characteristic diagnostic features, with a view toward rapid but accurate identification by amateur as well as by professional botanists. It follows that the specimens themselves have, in large part, supplied the answer to the problem of what characters to include in the keys. No species has been admitted unless an actual specimen has been seen by the writer. The keys, however, include the treatment of a large number of plants not accepted here as constituents of the Manitoba flora, but which have been reported from the province and, in many cases, may eventually prove admissible. These species have not been assigned numbers in the keys or text.

In many cases, following the name of the species, the other name or names (synonyms) are given by which it is designated in relevant literature. Vernacular or common names have been given where possible, but their arbitrary invention has been avoided. In the case of plants of common or relatively common occurrence, an indication is given as to the provincial range, followed by the locality, name of collector, and year for the northernmost (and, where advisable, southernmost) and earliest collections seen. This is followed by a reference to the first report in the literature of the plant for Manitoba. In the case of plants of which few collections have been made, locality, name of collector, and year are given for each specimen. Notes on habitat are included under the species concerned, and a final paragraph is given on its geographical area. Distribution maps are cited wherever possible.

The foundation of this flora is a card index system in which has been entered the data for all specimens seen, together with citations and other relevant notes taken from the literature, including information concerning northern distributional limits derived from the extensive literature on the botany of arctic and subarctic regions. Much help has been derived from a set of distribution maps for northern species compiled by A. E. Porsild, Chief Botanist, National Museum of Canada, for the use of which, and for his ever ready and stimulating help and advice, the writer here acknowledges his indebtedness and gratitude. Thanks are also due to the curators and staff of the herbaria visited during the course of this work, and for the loan of specimens. The herbarium of the University of Manitoba was visited on several occasions, as was also that of the Manitoba Provincial Museum. A period of two weeks was spent in the study of critical species in the Gray

Herbarium of Harvard University, Cambridge, Mass., and shorter periods were spent in the herbaria of the U.S. National Museum, Washington, D.C., and the University of Minnesota, Minneapolis, Minn. Free access was also offered to the herbarium of the Division of Botany and Plant Pathology, Department of Agriculture, Ottawa, where the entire Manitoba collection was indexed, and many loans of critical species were arranged. A short visit was made to the Marie-Victorin herbarium of the Botanical Institute of the University of Montreal, where the Manitoba collection of the Rev. G. de Ruyck was indexed.

Much credit must be given to the host of collectors, mostly amateur naturalists, who have contributed so greatly to our knowledge of the flora of the province. The earliest collections seen were made by John Richardson (later Sir John), during the Franklin expeditions of 1819–22, in the region between Lake Winnipeg and Hudson Bay. Next are those of a certain McTavish, in the services of the Hudson's Bay Company, whose collections at Churchill, York Factory, and Norway House are dated either 1853 or 1854. The collections of E. Bourgeau, botanist during the Palliser explorations of 1857–60, are correspondingly dated. John C. Schultz collected in southern Manitoba during the years 1860 and 1861. John Macoun made the first of his Manitoba collections in 1872. T. J. W. Burgess and G. M. Dawson collected in southern Manitoba in the years 1873 and 1874. Robert Bell collected between Lake Winnipeg and Hudson Bay in the years 1877, 1879, 1880, and 1884. Other collectors during the last two decades of the nineteenth century include the Rev. W. A. Burman, T. L. Walker, I. K. McMorine, and James Fletcher.

Among twentieth century collectors, the following have collected chiefly in the Hudson Bay region of the province, particularly at Churchill: Miss Eva Beckett, K. Birket-Smith, Miss Dorothy Brown, C. E. Cairnes, E. L. Core, W. G. Dore, N. Duman, A. Dutilly, J. H. Emerton, G. Gardner, J. M. Gillett, W. C. Güssow, F. Johansen, P. Q. MacKinnon, J. M. Macoun, N. Polunin, A. E. Porsild, N. W. Radforth, J. C. Ritchie, R. J. Rogers, and W. B. Schofield. Collectors in southern Manitoba include G. Batho, R. Bibbey, B. Boivin, A. J. Breitung, A. S. Brooks, A. C. Budd, A. H. R. Buller, J. A. Campbell, I. L. Conners, C. Cranston, N. Criddle, S. Criddle, W. N. Denike, W. G. Dore, Miss Margaret Dudley, Mrs. H. A. Fowler, C. Frankton, N. J. Freedman, C. Garton, W. L. Gordon, H. Groh, W. E. D. Halliday, W. Herriot, J. F. Higham, D. C. Hinks, P. J. Hyde, V. W. Jackson, T. Johnston, W. Krivda, W. Leach, D. R. Lindsay, A. Löve, Mrs. A. Löve, C. W. Lowe, H. Macdonald, J. M. Macoun, Mrs. E. J. McMillan, M. O. Malte, B. J. Marck, W. Marquardt, H. Marshall, T. Mawson, T. Mosquin, K. W. Neatby, R. F. Peterson, B. Petursson, Miss Freda Rook, J. S. Rowe, G. de Ruyck, H. A. Senn, Mrs. A. Simpson, Mrs. D. B. Sparling, G. Stevenson, G. Thomas, and H. A. Wallace.

The writer has spent five field seasons of two and a half to three months each in the province. The 1948 investigations were carried out in the Norway House – Cross Lake and Dawson Bay (Lake Winnipegosis) areas of central Manitoba [Scoggan, 1950]. In 1949, a survey was conducted along the Nelson–Echimamish–Hayes river system between Lake Winnipeg and Hudson Bay, the return trip being made by ascending Nelson River to Limestone Rapids, where the Hudson Bay Railway takes its northward course toward Churchill. The latter part of the summer was spent in the area of Wekusko Lake and Tramping Lake, some 90 miles northeast of The Pas [Scoggan, 1951]. The 1950 season included work in the Turtle, Riding, Duck, and Porcupine mountain areas, together with flights to Baralzon and Nejanilini lakes, camp-sites being located at lat. 60° 00′ N., long. 98° 10′ W. and lat. 59° 22′ N., long. 97° 46′ W., respectively [Scoggan, 1952]. The writer was accompanied by W. K. W Baldwin, also of the National Herbarium staff. The summers of 1951 and 1953 were spent in the southern half of the province [Scoggan, 1953]. Mr. Baldwin, during the 1951 season, carried out botanical investigations in the Reindeer–Nueltin lakes area of northwestern Manitoba [Baldwin, 1953].

## PHYSICAL FEATURES OF MANITOBA

The province of Manitoba extends for a distance of 750 miles between the forty-ninth and sixtieth parallels of latitude. Its greatest width is approximately 480 miles, at about the fifty-seventh parallel. Its total area is approximately a quarter of a million square miles, of which, however, only the section south and west of Lake Winnipeg is suitable for agriculture. Mining, trapping, fishing, and lumbering are important industries in the central and low-northern regions.

An excellent account of the geological formations of Manitoba is given by Wallace [1925], who notes the occurrence of five main groups, namely: Precambrian granites, gneisses, lavas, and sediments; Ordovician, Silurian, and Devonian limestones, dolomites, sandstones, and shales; and Cretaceous shales. The approximate extent of the five major formations is shown by Wallace in his Plate VIII, p. 36. The southwestern boundary of the Precambrian extends from the southeastern corner of the province up the long axis of Lake Winnipeg (an erosion lake between the Precambrian and the overlying limestones), and turns westward to the Saskatchewan boundary at about the fifty-fifth parallel. The northeastern boundary follows the coast of Hudson Bay from the sixtieth parallel to the neighbourhood of Churchill, from where the Precambrian-Ordovician contact extends in a generally southward direction to the Nelson River near Gillam, thence southeastward to the Hayes River, and east to the Ontario boundary at about latitude 55° 40′ N. Relatively narrow bands of Ordovician and Silurian formations parallel the two Precambrian boundaries, those to the northeast forming the Hudson Bay Lowlands, those to the southwest, together with an adjacent band of Devonian rocks, forming the Manitoba Lowlands (sometimes referred to as the "first prairie steppe"). To quote Wallace, "The southwestern part of Manitoba, north to the latitude of Dawson Bay, Lake Winnipegosis, which comprises about one-tenth of the area of the province, is a region of elevations in general between 1,300 and 1,400 feet, underlain by Cretaceous shales, and is known as the 'second prairie steppe'. It is separated from the lower first prairie steppe to the east by the Manitoba Escarpment, a chain of hills and low mountains trending in a north-northwesterly direction. These are Pembina Mountain, Tiger Hills, Riding Mountain, Duck Mountain, and Porcupine Mountain, with a continuation into central eastern Saskatchewan known as the Pasquia Hills." The several subdivisions of the first and second prairie levels in Manitoba are outlined by Ellis [1938, pp. 22–25]. Their altitudes, surface deposits, and soil types are shown in his Figures 5, 4, and 13, respectively.

Because of intense erosion, rocks of Tertiary age occur in Manitoba only, so far as known, on Turtle Mountain, an outlier of the extensive Tertiary deposits of southern Saskatchewan. The Missouri Coteau, Wood Mountain, and Cypress Hills are prominent features of this third or western prairie steppe.

The topography of the province, of which the highest elevation is the 2,727-foot peak Baldy of Duck Mountain, has been influenced not only by the character of the bedrock, but also by glacial and postglacial phenomena. Upon the gradual recession of the Wisconsin ice-sheet following the Pleistocene glaciation, a large body of fresh water was left covering the entire Manitoba Lowlands, extending at its maximum to approximately the fifty-fifth parallel and covering the upper part of the present Nelson River system. This forerunner of the present-day lakes Winnipeg, Manitoba, and Winnipegosis is known as Glacial Lake Agassiz. It was preceded by the much smaller Glacial Lake Souris on the Cretaceous plateau to the southwest, this lake originally draining southward by way of the lower levels of the present Souris Basin west of Turtle Mountain, but later draining eastward into youthful Lake Agassiz by way of the present-day Pembina River channel. The flat, smooth topography of the Manitoba Lowlands is the result of the deposition of silts and clays in Lake Agassiz, which, during its various phases of drainage, established the many beaches now traceable along the Manitoba Escarpment as gravel ridges or wave-cut terraces. According to Upham [1890], the waters of Lake Agassiz at the time of the formation of its highest beach covered the present site of Winnipeg to a depth of about 600 feet.

Until recently it has been generally assumed that the time elapsed since the last glacial maximum of the Wisconsin ice-sheet is in the neighbourhood of 25,000 years, and that the northeastward drainage system of Lake Agassiz into Hudson Bay, upon the melting of the northern ice barrier, was established approximately 9,000 years ago. Flint and Deevey [1951], however, report that radiocarbon measurements of wood from the Two Creeks peat formation immediately underlying the Mankato drift in Wisconsin give the age of the wood as only about 11,000 years, a result that "seems to have been anticipated by the opinions of some geologists and soil scientists, who had come to believe that the degree of soil development and erosion on the Mankato drift are inconsistent with an age as great as 25,000 years... The whole process of deglaciation seems to have been more rapid than had been supposed." In Manitoba, then, the period available since Pleistocene times for colonization of extensive parts of the land by plants may eventually prove to be of the order of only four or five thousand years. The presence of a former great lake in the Red River basin of Manitoba was first noted by Palliser [1863, p. 41], in the following words: "This plain, no doubt, had formed at one time the bed of a sheet of water, and Pembina Hill, consisting of previously-deposited materials, was its western shore." For further accounts of Lake Agassiz, the following may be consulted: Upham [1895]; Wallace [1925]; Antevs [1931]; Leverett [1932]; and Johnston [1946]. An excellent account of the Pleistocene geology of southwestern Manitoba is given by Elson [1954].

As in the Red River Valley and the lake district, the country north and northeast of Lake Winnipeg is mainly a broad, nearly flat expanse, the result of heavy glaciation and, at the two extremities, post-glacial submergence.

The Nelson–Echimamish–Hayes river route followed by the writer's party in 1949 between Norway House and York Factory is described in detail by Bell [1879], who states that "The region through which the upper two-thirds of the Nelson River flows may be described as a tolerably even Laurentian plain, sloping toward the sea at the rate of about two feet in the mile. The river, for the first hundred miles from Great Playgreen Lake, does not flow in a valley but spreads itself by many channels over a considerable breadth of country. This tendency to give off 'stray' channels is characteristic of many rivers throughout the northern and comparatively level Laurentian regions, but it is perhaps more strongly marked in the Nelson than in any other." The 50-mile stretch from Norway House to within a few miles of Painted Stone portage at the headwaters of the Echimamish has been further smoothed out by the deposition of clays and sands in this northern boundary area of Lake Agassiz, and, from near the mouth of Fox River, about 75 miles southwest of York Factory, to Hudson Bay, the Hayes meanders in a narrow valley deeply eroded into the nearly level glacial till and marine deposits of the Hudson Bay Lowlands.

It is well established that there has been considerable uplift of the Hudson Bay Lowlands following deglaciation. The remarkably regular meandering of the lower Hayes River in the Lowlands is characteristic of a mature stage, and the present steep clay banks, 30 to 200 feet high, point to uplift since the establishment of the meander pattern during an earlier, more sluggish phase. As in the case of the Hayes, the lower stretches of the Nelson and Churchill rivers are characterized by swift currents and steep banks of clay or limestone. Post-glacial uplift along the west coast of the Bay is well illustrated by Plate I (frontispiece), showing the concentric pattern of raised shorelines on Marsh (Beacon) Point, between the estuaries of the Hayes and the Nelson. An old map shows a channel crossing Marsh Point, formerly used to avoid the difficult passage around. This corroborates evidence along other parts of the Bay of regular lines of driftwood well above the present highest tides, and of numerous raised beaches in which marine shells have been found between elevations of 200 to 500 feet. Gutenberg [1941], on the basis of tide-gauge data, supports the view of Bell [1898] that uplift is still progressing at the rate of 5 to 10 feet per century. Among other points, Bell cited the following: (1) old navigation records, and the increasing difficulty of reaching trading posts along the Bay by boat; (2) the well preserved nature of shells of moderately deep-water species of molluscs in the clay shores of James Bay; (3) the drying up of salt-marsh feeding grounds of ducks and geese within memory of living man; (4) the appearance of trees on river islands during the same period; (5) the presence northward of remains of Eskimo beach dwellings up to elevations of 70 feet; (6) the present inappropriateness of many of the aboriginal place-names of James Bay. On the other hand, Tyrrell [1896] and Cooke [1942] are of the opinion that there has been relatively little uplift in recent times. Lougee [1953], however, accepts a present uplift rate of several feet per century.

A description of the general character and vegetation of the Reindeer–Nueltin lakes area of northwestern Manitoba is given by Tyrrell [1897] and Baldwin [1953]. The vegetation of the extreme northeastern interior, as found at Nejanilini (Duck) Lake (lat. 59° 22′ N., long. 97° 46′ W.) and Baralzon Lake (lat. 60° 00′ N., long. 98° 10′ W.), has been dealt with by the writer in a preliminary report [Scoggan, 1952]. The physical features of the Hudson Bay coastal area, particularly in the neighbourhood of Churchill, have been described by Bell [1880, 1881], Preble [1902], Johansen [1933], Gardner [1937], Shelford and Twomey [1941], McClure [1943], and Radforth [1950]. The classification of muskeg types in the Churchill area forms the basis of an interesting paper by Radforth [1952].

## CLIMATE AND VEGETATION

Tables I and II have been compiled from Volume I of "Climatic Summaries for Selected Meteorological Stations in the Dominion of Canada", issued by the Meteorological Division of the Department of Transport, Canada. The localities chosen are indicated by the following numbers: (1) Brandon; (2) Winnipeg; (3) Swan River, north of Duck Mountain; (4) Berens River, about the middle of the east coast of Lake Winnipeg; (5) The Pas; (6) Norway House; (7) Port Nelson, and (8) Churchill.

*Table I. Monthly and Annual Averages of Daily Mean Temperature*

(degrees Fahrenheit)

| — | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Years obs. | 29 | 66 | 11 | 19 | 27 | 40 | 11 | 30 |
| January | −3 | −3 | −6 | −8 | −9 | −11 | −17 | −19 |
| February | 1 | 2 | −6 | −3 | −2 | −4 | −14 | −17 |
| March | 16 | 16 | 9 | 10 | 11 | 9 | −2 | −6 |
| April | 38 | 38 | 39 | 31 | 33 | 29 | 17 | 14 |
| May | 51 | 52 | 49 | 56 | 48 | 45 | 33 | 30 |
| June | 60 | 62 | 59 | 58 | 59 | 57 | 45 | 43 |
| July | 65 | 67 | 64 | 63 | 65 | 63 | 55 | 54 |
| August | 62 | 64 | 61 | 60 | 61 | 60 | 53 | 52 |
| September | 53 | 54 | 51 | 50 | 49 | 48 | 44 | 42 |
| October | 40 | 41 | 38 | 36 | 35 | 36 | 30 | 27 |
| November | 21 | 22 | 18 | 19 | 17 | 16 | 10 | 6 |
| December | 6 | 6 | 2 | 0 | 1 | −2 | −9 | −11 |
| Annual Average | 34 | 35 | 31 | 30 | 31 | 29 | 21 | 18 |

*Table II. Average Monthly and Annual Precipitation*

(inches)

| — | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Years obs. | 29 | 66 | 11 | 20 | 27 | 40 | 11 | 30 |
| January | 0·73 | 0·92 | 0·63 | 0·79 | 0·61 | 0·69 | 0·60 | 0·48 |
| February | 0·58 | 0·86 | 0·65 | 0·75 | 0·50 | 0·78 | 0·46 | 0·61 |
| March | 0·76 | 1·19 | 1·14 | 1·00 | 0·72 | 1·01 | 0·58 | 0·87 |
| April | 0·99 | 1·37 | 0·79 | 0·92 | 0·81 | 0·74 | 0·88 | 0·89 |
| May | 1·62 | 2·26 | 1·52 | 1·41 | 1·38 | 1·08 | 0·85 | 0·93 |
| June | 2·77 | 3·15 | 3·41 | 2·49 | 2·20 | 1·93 | 2·07 | 1·85 |
| July | 2·37 | 3·08 | 2·80 | 2·25 | 2·22 | 2·29 | 1·64 | 2·19 |
| August | 2·18 | 2·45 | 2·27 | 1·99 | 2·11 | 2·38 | 2·08 | 2·69 |
| September | 1·52 | 2·35 | 1·78 | 2·94 | 1·96 | 1·85 | 1·79 | 2·33 |
| October | 0·83 | 1·49 | 0·82 | 1·62 | 1·16 | 0·93 | 0·96 | 1·43 |
| November | 0·79 | 1·12 | 1·13 | 1·31 | 0·98 | 1·07 | 1·04 | 1·03 |
| December | 0·59 | 0·95 | 0·98 | 1·02 | 0·79 | 0·83 | 0·81 | 0·66 |
| Annual Average | 15·73 | 21·19 | 17·92 | 18·49 | 15·44 | 15·58 | 13·76 | 15·96 |

Manitoba isotherms of average monthly maximum and minimum temperature (the average of the highest and lowest temperatures reached in each month of record) and of average monthly mean maximum and minimum temperature (the average of the highest and lowest temperatures reached each day during the period of record for each month) are mapped by Connor [1939], and those of average daily maximum July temperatures and daily minimum January temperatures are mapped by Harrison [1934]. Isotherms of mean annual temperature for Canada are given by Jenness [1949] and Thomas [1953]. As pointed out by Harrison, "The irregular convolutions of the isothermic lines in the southern half of the province are due largely to the influence of local topography, particularly the large lakes and the chain of hills known as the Manitoba Escarpment". The influence of the waters of Hudson Bay in modifying the January minimum can be clearly seen. The general northwesterly trend of the lines representing July maxima in the northern part of the province is of great importance, in so far as it indicates that conditions more favourable to plant growth are found in that direction, whereas toward the northeast they rapidly become less favourable.

This latter phenomenon finds expression in the fact that the only part of the province in which typical open arctic tundra occurs is the extreme northeastern interior, as exemplified in Plate VIII B for the Baralzon Lake district. The somewhat rolling terrain includes areas of xerophytic barren ground, with numerous frost polygons, alternating with wet areas of open muskeg in the depressions and around ponds. The forest-tundra section further south is characterized by patches of spruce forest in an area otherwise dominated by treeless barren ground. It is well illustrated for Nueltin Lake in Plate XXIX of Baldwin [1953], and for Nejanilini Lake in Plate VIII A of the present publication; both plates show patches of black spruce occupying lowland and lakeshore sites.

The northern two-thirds of Manitoba, north of a line running approximately from Berens River, near the middle of the east coast of Lake Winnipeg, to the neighbourhood of The Pas, has been placed by Thornthwaite [1931] in his D′ (taiga) and E′ (tundra) climatic provinces. Temperature here is the limiting factor for plant growth because of inadequate "temperature efficiency". Permafrost is of general occurence throughout these two climatic provinces, as illustrated in a map of Jenness [1949], on which it is reported to underlie large areas in the Amery, York Factory, Port Nelson, and Churchill districts [*see also* Johnston, 1930], and to occur at various other points, chiefly under muskeg only, as far south as Island Lake, near the Ontario boundary east of the north end of Lake Winnipeg. On July 14, 1949, the writer observed permafrost in the clay banks of a stream entering Hayes River at The Rock, about 100 miles southwest of York Factory. Seepage water, stream water, and Hayes River water had temperatures of 40°F., 55°F., and 65°F., respectively. Concerning the lower Hayes, Bell [1879] notes that "There is certainly evidence of the existence of frost in banks of these rivers and under the peaty layers above them in the month of July, but it is known that in southern parts of the Dominion the frost penetrates to a greater depth into the face of exposed banks than into the level ground, and is frequently found in such situations in the middle of summer."

The southern third of the province falls within three of Thornthwaite's climatic provinces. The extreme southwestern corner is assigned to the DC′ d climatic province; that part of Manitoba east of the Red River and the southern half of Lake Winnipeg is assigned to the CC′ r climatic province; and the large intervening part is assigned to the CC′ d climatic province. The symbols have the following meanings: C, sub-humid; D, semiarid; C′, microthermal; d, moisture deficient at all seasons; r, moisture abundant at all seasons. In these southern regions, precipitation is the principal climatic factor affecting plant growth; its seasonal distribution and its range of fluctuation from year to year being of prime importance. According to Ellis and Shafer [1940], the annual precipitation in southwestern Manitoba varies in different years from 10·24 to 27·87 inches. "Years with low rainfall may be expected more frequently than years with high rainfall, but the occasional years of very high rainfall raise the yearly average and tend to mask the actual conditions." Their figures also indicate that atmospheric drought throughout the growing season for crops is a fairly frequent regional problem. Thornthwaite's humidity provinces are founded upon the effectiveness of precipitation for plant growth, this being determined not only by the amount of rainfall but also by the rate of loss through evaporation. The ratio of precipitation to evaporation for any given month is called the P-E ratio, and the sum of the twelve monthly ratios is called the P-E index. The latter for extreme southwestern Manitoba lies between 16 and 31 in Thornthwaite's scale, a position which reflects the semiarid nature of the region. The P-E indices of the remaining two climatic provinces of southern Manitoba lie between 32 and 63, although the P-E index must be more than 48 for the southeastern district to be classed as "r". According to Ellis [1938], the P-E index of the southern part of this latter district, corresponding to the Rainy River section of the Great Lakes – St. Lawrence Forest region of Halliday [1937], is 49·9, whereas, that of the more western parts of southern Manitoba ranges between 42·2 and 45·4.

The semiarid extreme southwestern corner of Manitoba is placed by Dice [1943] in the Saskatchewan biotic province; this extends westward to central Alberta and southward to northeastern Wyoming and northwestern Nebraska. The extreme southeastern corner of the province is placed in the Canadian biotic province, which includes most of the Great Lakes region, the Maritime Provinces, and the New England States. Between these two is the northern boundary of the Illinoisan biotic province, which extends southward to eastern Kansas, northern Missouri, and northern Illinois. The greater part of the province is placed by Dice in the transcontinental Hudsonian biotic province, corresponding closely to the great northern conifer forest dominated by white and black spruce, the Boreal Forest region of Halliday [1937]. The northeastern corner of the province is placed in the transcontinental Eskimoan biotic province of the arctic tundra.

## MAJOR VEGETATION TYPES

A brief outline follows of the various vegetation regions of Manitoba as shown in the map of Halliday [1937]. The Manitoba portion of Halliday's map is also shown in the papers of Ellis [1938] and Lowe [1943], and includes (1) the Grassland, (2) the Great Lakes – St. Lawrence Forest, (3) the Boreal Forest, (4) the Tundra-Forest, and (5) the Tundra regions.

## (1) THE GRASSLAND REGION

The Grassland region of Manitoba may be subdivided into the Red River Valley prairie, extending south of Winnipeg to the International Boundary and west of the Manitoba Escarpment; the Southwestern plains, in the extreme southern part of the province west of approximately the midpoint of the International Boundary; and a more northerly Aspen Parkland region [*see* Bird, 1930, fig. 1], crossing the International Boundary near the ninety-sixth meridian, and having irregular extensions northward to about midway between the fifty-first and fifty-second parallels.

The Red River Valley prairie, lying in the bottomlands of Glacial Lake Agassiz, is a region of moist prairie interspersed with extensive areas of marshland. The southwestern prairie, on the other hand, lying in the bottomlands of Glacial Lake Souris, is high and dry, with relatively small areas of swamp or marsh. The Aspen Parkland (Plate III A) is a region of transition between the true prairie and the coniferous forest, and according to Bird "is characterized by forest stretching far into the prairie along the rivers, and by groves of trees interspaced by prairie, which is found to be gradually crowded out as one approaches the forest. . . It is replacing the prairie over practically all its southern front, and to the north in some localities, at least, is in turn being replaced by spruce."

Most of the prairie region of Manitoba is under cultivation (Plate II A), and what remains of the original prairie flora is best found in the sandhill areas near such places as Melita, Lauder, Hartney, Oak Lake, Carberry, and Glenboro, or on the dry valley slopes and crests of the Souris, Assiniboine, and Qu'Appelle rivers. Plate II B illustrates the southwestern upland prairie at Victor, above the Qu'Appelle River near the Saskatchewan boundary west of St. Lazare. The dry, sandy roadside is lined with prairie-sagewort (*Artemisia frigida*), which here takes advantage of the high degree of freedom from competition with other prairie species. The flat expanse of dry prairie and the valley slopes and sandhills in the vicinity of Victor and St. Lazare and other similar localities are characterized by the following species: *Equisetum laevigatum, Selaginella rupestris, Festuca altaica, F. ovina* var. *saximontana, Poa arida, P. glaucifolia, P. cusickii, P. nemoralis* var. *interior, Agropyron dasystachyum, A. smithii, Elymus canadensis, E. macounii, Koeleria cristata, Helictotrichon hookeri, Deschampsia cespitosa, Oryzopsis hymenoides, O. micrantha, Stipa spartea, S. comata, S. viridula, Muhlenbergia richardsonis, Sporobolus cryptandrus, S. heterolepis, Agrostis scabra, Calamovilfa longifolia, Calamagrostis montanensis, Bouteloua gracilis, B. curtipendula, Andropogon scoparius, A. gerardi, A. hallii, Panicum leibergii, P. wilcoxianum, Cyperus schweinitzii, Carex stenophylla* var. *enervis, C. siccata, C. praticola, C. brevior, C. cumulata, C. xerantica, C. saximontana, C. filifolia, C. obtusata, C. pensylvanica* var. *digyna, C. rossii, Tradescantia occidentalis, Allium textile, A. cernuum, A. stellatum, Smilax herbacea* var. *lasioneura, Lilium philadelphicum* var. *andinum, Smilacina stellata, Zigadenus elegans, Hypoxis hirsuta, Sisyrinchium montanum, Salix humilis* var. *microphylla, Comandra richardsiana, C. pallida, Eriogonum flavum, Salsola kali* var. *tenuifolia, Corispermum nitidum, C. hyssopifolium, C. simplicissimum, Chenopodium leptophyllum, Amaranthus albus, A. graecizans, Mirabilis nyctaginea, M. hirsuta, Arenaria dawsonensis, Cerastium nutans, C. arvense, C. arvense* var. *viscidulum, Lychnis drummondii, Anemone* *patens* var. *wolfgangiana*, *A. cylindrica*, *A. multifida*, *Ranunculus rhomboideus*, *Cleome serrulata*, *Lesquerella ludoviciana*, *Descurainia pinnata* var. *brachycarpa*, *D. richardsonii*, *Erysimum inconspicuum*, *E. asperum*, *Arabis holboellii* var. *retrofracta*, *A. holboellii* var. *collinsii*, *A. hirsuta* var. *pycnocarpa*, *A. divaricarpa*, *Heuchera richardsonii*, *Rosa arkansana*, *Geum triflorum*, *Chamaerhodos erecta*, *Potentilla arguta*, *P. gracilis*, *P. gracilis* var. *pulcherrima*, *P. gracilis* var. *rigida*, *P. concinna*, *P. effusa*, *P. hippiana*, *P. pensylvanica*, *P. pensylvanica* var. *bipinnatifida*, *Prunus pumila* var. *cuneata*, *Thermopsis rhombifolia*, *Lotus americana*, *Psoralea argophylla*, *P. esculenta*, *Amorpha nana*, *A. canescens*, *Petalostemum candidum*, *P. occidentale*, *P. purpureum*, *P. villosum*, *Oxytropis splendens*, *O. sericea* var. *spicata*, *O. campestris* var. *gracilis*, *O. lambertii*, *Astragalus triphyllus*, *A. caryocarpus*, *A. lotiflorus*, *A. flexuosus*, *A. bisulcatus*, *A. missouriensis*, *A. pectinatus*, *A. canadensis*, *A. striatus*, *A. goniatus*, *A. tenellus*, *A. aboriginorum*, *A. linearis*, *Glycyrrhiza lepidota*, *Hedysarum alpinum* var. *americanum*, *Vicia americana*, *V. americana* var. *truncata*, *Lathyrus venosus* var. *intonsus*, *L. ochroleucus*, *Linum rigidum*, *L. sulcatum*, *L. lewisii*, *Euphorbia glyptosperma*, *E. serpyllifolia*, *E. esula*, *Rhus radicans* var. *rydbergii*, *Sphaeralcea coccinea*, *Viola pedatifida*, *V. adunca*, *Opuntia fragilis*, *O. polyacantha*, *Mamillaria vivipara*, *Elaeagnus commutata*, *Gaura coccinea*, *Oenothera nuttallii*, *Zizia aptera*, *Z. aurea*, *Cymopteris acaulis*, *Lomatium foeniculaceum*, *Musineon divaricatum*, *Arctostaphylos uva-ursi*, *Dodecatheon meadia*, *Androsace occidentalis*, *Apocynum sibiricum*, *Asclepias viridiflora*, *A. viridiflora* var. *lanceolata*, *A. viridiflora* var. *linearis*, *A. verticillata*, *A. ovalifolia*, *Phlox hoodii*, *Lithospermum canescens*, *L. incisum*, *Onosmodium hispidissimum*, *O. occidentale*, *Lappula redowskii* var. *occidentalis*, *Agastache foeniculum*, *Monarda fistulosa*, *Solanum rostratum*, *Physalis virginiana*, *Penstemon nitidus*, *P. albidus*, *P. gracilis*, *Castilleja sessiliflora*, *Orthocarpus luteus*, *Orobanche fasciculata*, *O. ludoviciana*, *Houstonia longifolia*, *Galium septentrionale*, *Symphoricarpos occidentalis*, *Campanula rotundifolia*, *Lobelia spicata* var. *hirtella*, *Liatris punctata*, *L. ligulistylis*, *Grindelia squarrosa*, *Gutierrezia diversifolia*, *G. sarothrae*, *Chrysopsis villosa*, *C. hispida*, *Solidago missouriensis*, *S. memoralis* var. *decemflora*, *S. mollis*, *S. canadensis* var. *gilvocanescens*, *S. rigida*, *Haplopappus spinulosus*, *Aster ptarmicoides*, *A. pansus*, *A. falcatus*, *A. laevis*, *Townsendia exscapa*, *Erigeron strigosus*, *E. glabellus*, *E. asper*, *Antennaria campestris*, *A. aprica*, *A. parvifolia*, *Ambrosia psilostachya* var. *coronopifolia*, *Rudbeckia serotina*, *Echinacea angustifolia*, *Ratibida columnifera*, *Helianthus laetiflorus* var. *rigidus*, *H. laetiflorus* var. *subrhomboideus*, *Coreopsis tinctoria*, *Gaillardia aristata*, *Achillea lanulosa*, *Artemisia frigida*, *A. cana*, *A. glauca*, *A. caudata*, *A. longifolia*, *A. ludoviciana* var. *gnaphalodes*, *A. ludoviciana* var. *pabularis*, *A ludoviciana* var. *latifolia*, *Senecio integerrimus*, *S. canus*, *S. tridenticulatus*, *S. plattensis*, *S. aureus*, *S. pauperculus*, *Cirsium flodmanii*, *C. drummondii*, *Lactuca pulchella*, *L. ludoviciana*, *Lygodesmia juncea*, *L. rostrata*, *Agoseris cuspidata*, *A. agrestis*, *A. glauca*, *Crepis runcinata*, and *C. runcinata* ssp. *glauca*. The dominant trees of the aspen parkland groves are *Populus tremuloides*, *P. balsamifera*, and *Quercus macrocarpa*. A remarkable relic colony of scattered individuals and small groups of white spruce (*Picea glauca*), associated with creeping juniper (*Juniperus horizontalis*), occurs at Spruce Woods Forest Reserve (Plate III B), southeast of Brandon, in a sandy area of otherwise almost pure prairie vegetation.

Quoting from a previous paper of the writer [1952], "It is generally believed that, following migration of the conifer forest northward, possibly during a postglacial xerothermic period, aspen groves remained in moist and sheltered positions along the southern front, while prairie invaded the drier areas"; and, concerning such sandhill areas as that shown in Plate IV A, photographed near Hartney, "Sand originating from glacial Lake Souris has here been blown into low dunes, but the presence of buried soils in some parts indicates that some of the dune formation occurred at a relatively recent date, perhaps following deterioration of the plant cover during periods of severe drought [Ellis and Shafer, 1940]. . . It seems probable that the tree species established themselves in the dune area following stabilization and enrichment of the sand by prairie species before this final disruption of the prairie community, to which shading by trees may have been a hastening factor. Breaking of the prairie sod by erosion in many places throughout the rolling terrain, or the predominance of the more open bunch-grass type of vegetation, presumably opened the way to invasion by forest species, initiating the final stage in the succession. Once established, perhaps during an especially favourable succession of moist years, soil moisture conditions would be the critical factor for continued survival. Tongues of forest stretch throughout the prairies along the margins of rivers and streams. The supply of moisture on the dunes is less reliable, but evidently not to the degree that scrub stands of aspen, poplar, and bur oak cannot maintain themselves. Low sand-dunes generally contain considerable amounts of moisture a few inches below the surface, and this moisture is more available than that of fine-grained soils. The sand loses water readily from the surface, but this is compensated for to a large extent by the mulching effect of the dry surface layer. The trees further reduce surface evaporation by their shade and accumulated litter and tend to stabilize the dunes, although aspen and poplar can withstand considerable burial of the trunk by sand."

Concerning the treelessness of the more level parts of the prairie, the writer [1952] has also stated that "High summer temperatures, warm dry winds, and relatively low precipitation of varying seasonal distribution, fluctuating widely from year to year, undoubtedly make soil moisture the limiting factor for plant growth in the prairie region. . . The characteristic absence of trees on exposed, well-drained upland sites reflects the adverse influence of low precipitation effectiveness, although the extremely tough nature of the thick prairie sod is undoubtedly also a major barrier to the establishment of tree seedlings. The well established and extensive root systems of the prairie species, which thoroughly occupy the soil in several more or less distinct strata from a level immediately below the surface, greatly reduce the chances for survival of tree seedlings, which must also withstand the extremely severe conditions of the first winter's exposure. These factors may largely explain the scarcity of annuals in the prairie flora, as well as of weeds, except in disturbed areas."

Cleared areas in the dry upland prairie, as illustrated by the roadside habitat in the sandhill region near Hartney, about 35 miles southwest of Brandon, shown in Plate IV A, and by the "blow-out" near St. Lazare, about 75 miles northwest of Brandon, shown in Plate IV B, typically possess an interesting mixture of prairie species and foreign weeds, and again direct attention to the factor of plant competition. To quote from

Shimek [1927], "The belief that the prairie flora will not return if the prairie is broken is widely prevalent. With it is linked the further belief that the prairie flora is not a climax flora, but that it represents a transition stage which would culminate in a forest with the cessation of prairie fires, were it not for the disturbance of the prairie surface by cultivation. . .It is true that the prairie yields readily to cultivation. The breaking of the prairie turf is sufficient to cause most of the prairie plants to disappear from the broken surface, but there is abundant evidence to show that it requires continued cultivation to keep them out. Their return is rather slow and is preceded by a transitional mixture of species, but it is quite certain, provided man does not interfere."

The "blow-out" shown in Plate IV B had, in an area measuring approximately 150 by 75 feet, the following flora: *Selaginella rupestris, Juniperus horizontalis, Bouteloua gracilis, Setaria viridis, Echinochloa crusgalli, Agropyron trachycaulum* var. *unilaterale, Allium stellatum, Polygonum convolvulus, P. erectum, Chenopodium album, Axyris amaranthoides, Salsola kali* var. *tenuifolia, Corispermum hyssopifolium, Amaranthus retroflexus, A. graecizans, A. albus, Cerastium arvense, Sisymbrium altissimum, Lepidium densiflorum, Erysimum asperum, E. inconspicuum, Descurainia pinnata* var. *brachycarpa, Heuchera richardsonii, Potentilla arguta, P. pensylvanica, Chamaerhodos erecta, Rosa acicularis, Geum triflorum, Prunus pumila* var. *cuneata, Astragalus striatus, Melilotus alba, Euphorbia glyptosperma, E. serpyllifolia, Androsace occidentalis, Lappula redowskii* var. *occidentalis, Lithospermum incisum, Solanum triflorum, Galium septentrionale, Campanula rotundifolia, Artemisia frigida, A. ludoviciana* var. *gnaphalodes, A. caudata, Solidago missouriensis, Chrysopsis hispida, Erigeron canadensis, E. glabellus, Achillea millefolium, Iva xanthifolia,* and *Taraxacum officinale.* Gravelly openings in the prairie near Reston and Broomhill, in extreme southwestern Manitoba, had many of the foregoing prairie and weedy species, as well as the following prairie species: *Koeleria cristata, Anemone patens* var. *wolfgangiana, Draba nemorosa* var. *lejocarpa, Arabis holboellii* var. *retrofracta, Lesquerella ludoviciana, Psoralea argophylla, Oenothera nuttallii, Gaura coccinea, Aster pansus, A. ptarmicoides, Gaillardia aristata, Grindelia squarrosa, Liatris punctata, Cirsium flodmanii,* and *Gutierrezia diversifolia.*

The general conclusion appears warranted that the prairie flora is a remarkably hardy one, able to persist under conditions of rather extreme aridity, as in the case of most of our common weeds, but unable to compete against the shading effect of trees once these have become established.

Low-lying prairie, as found commonly in the Red River Valley or in the basin of the Souris River (Plate V A) or its old channels in southwestern Manitoba, is generally quite markedly alkaline in its reaction, as indicated by the occurrence of the following more or less halophytic species: *Triglochin maritima, Spartina gracilis, Puccinellia nuttalliana, Schedonnardus paniculatus, Distichlis stricta, Eleocharis acicularis, Juncus bufonius* var. *halophilus, Rumex maritimus* var. *fueginus, Salicornia rubra, Suaeda depressa, Atriplex nuttallii, A. patula, A. patula* var. *hastata, A. argentea, Monolepis nuttalliana, Chenopodium rubrum, C. glaucum* var. *salinum, Spergularia marina, Myosurus minimus, Ranunculus cymbalaria, Glaux maritima, Veronica peregrina* var. *xalapensis, Plantago elongata, P. eriopoda, Iva*

*axillaris*, and *Artemisia cana*. On the alkaline flats of an old Souris River channel south of Melita, in southwestern Manitoba, occur the only known stations in the province of *Buchloë dactyloides* and *Allocarya californica*.

Ponds, streams, and wet shores in the prairie region are characterized by the following species: *Typha latifolia*, *Sparganium eurycarpum*, *S. multipedunculatum*, *Zannichellia palustris*, *Ruppia maritima* var. *occidentalis*, *Potamogeton vaginatus*, *P. pectinatus*, *P. zosteriformis*, *P. foliosus*, *P. friesii*, *P. pusillus*, *P. natans*, *P. gramineus*, *P. praelongus*, *P. richardsonii*, *Sagittaria cuneata*, *S. latifolia*, *Alisma triviale*, *Elodea canadensis*, *Vallisneria americana*, *Glyceria grandis*, *G. striata*, *G. pulchella*, *Scolochloa festucacea*, *Phragmites communis* var. *berlandieri*, *Alopecurus aequalis*, *Beckmannia syzigachne*, *Spartina pectinata*, *Phalaris arundinacea*, *Zizania aquatica* var. *interior*, *Carex lanuginosa*, *C. lasiocarpa* var. *americana*, *C. atherodes*, *C. lacustris*, *C. aquatilis*, *C. rostrata*, *Scirpus americanus*, *S. validus*, *S. acutus*, *S. fluviatilis*, *S. paludosus*, *S. microcarpus* var. *rubrotinctus*, *Eleocharis palustris*, *E. acicularis*, *E. compressa*, *Eriophorum viridi-carinatum*, *Lemna minor*, *L. trisulca*, *Polygonum amphibium* var. *stipulaceum* f. *fluitans*, *P. coccineum*, *P. coccineum* var. *pratincola*, *Ceratophyllum demersum*, *Nuphar variegatum*, *Caltha palustris*, *Ranunculus aquatilis* var. *capillaceus*, *R. circinatus* var. *subrigidus*, *R. flabellaris*, *R. gmelini* var. *hookeri*, *Callitriche palustris*, *C. hermaphroditica*, *Hippuris vulgaris*, *Myriophyllum spicatum* var. *exalbescens*, *M. verticillatum* var. *pectinatum*, *Sium suave*, *Cicuta maculata*, *Naumburgia thyrsiflora*, *Menyanthes trifoliata*, *Scutellaria galericulata* var. *epilobiifolia*, *Lycopus americanus*, *L. asper*, *Mentha arvensis* var. *villosa*, *Mimulus glabratus* var. *fremontii*, *Limosella aquatica*, *Veronica salina*, *Utricularia vulgaris*, *Bidens cernua*, *Megalodonta beckii*, and *Senecio congestus* var. *palustris*.

### (2) THE GREAT LAKES – ST. LAWRENCE FOREST REGION

A small part of extreme southeastern Manitoba, including Sandilands Forest Reserve (Plate V B), is placed by Halliday [1937] in his Rainy River section of the Great Lakes – St. Lawrence Forest region. According to Halliday, "During its early stages glacial Lake Agassiz extended to the east in a wide lobe, reaching Rainy lake and passing to the south of Red lake in Minnesota. Over this country lacustrine and modified glacial deposits are found. Two islands of higher land, however, with morainic material and outwash sands, were not covered by the lake; these are the Beltrami uplands in Minnesota and a smaller area, the Sandilands, in Manitoba. . . In general, the topography is flat and undulating, and swamps are numerous. . . The nature of the ground and drainage has favoured the development of large black spruce, tamarack, and Eastern white cedar swamps and willow and alder scrub. . . The northwestern limits of the Section are principally determined by the range of this association and the presence of cedar. Inland from the rivers are large areas of balsam poplar of fair size, white spruce, balsam fir, and scattered tamarack. On the river-banks are white elm, basswood, Manitoba maple, and bur oak. . . large-toothed aspen occurs throughout. . . red pine apparently in the past occurred in some quantity on the light soils of the Sandilands, but is now replaced largely by jack pine after fires, and the white pine has been removed by lumbering."

The following species were found in the dry, sandy jack-pine woods of Sandilands Forest Reserve: *Equisetum hyemale* var. *affine, Lycopodium complanatum, Osmunda claytoniana, Pteridium aquilinum* var. *latiusculum, Pinus banksiana, Juniperus communis* var. *depressa, Oryzopsis asperifolia, Maianthemum canadense* var. *interius, Clintonia borealis, Smilax herbacea* var. *lasioneura, Lilium philadelphicum, Populus tremuloides, P. balsamifera, Corylus americana, Rumex acetosella, Silene antirrhina, Anemone patens* var. *wolfgangiana, A. quinquefolia* var. *interior, Lepidium densiflorum, Heuchera richardsonii, Potentilla tridentata, P. norvegica, Prunus nigra, P. pensylvanica, P. virginiana, P. pumila, Rosa acicularis, Amelanchier alnifolia, Vicia americana, Lathyrus ochroleucus, L. venosus* var. *intonsus, Rhus radicans* var. *rydbergii, Ceanothus ovatus, Aralia nudicaulis, Arctostaphylos uva-ursi* var. *coactilis, Gaultheria procumbens, Vaccinium myrtilloides, Apocynum androsaemifolium, Lithospermum canescens, Galium septentrionale, Viburnum trilobum, Crepis tectorum, Erigeron philadelphicus, Senecio pauperculus,* and *Artemisia caudata* var. *calvens.*

The following were found in a muskeg forest of black spruce and tamarack: *Equisetum fluviatile, Picea mariana, Larix laricina, Carex interior, C. leptalea, C. rostrata* var. *utriculata, C. disperma, C. gynocrates, C. aurea, Eriophorum angustifolium, Smilacina stellata, S. trifolia, Orchis rotundifolia, Cypripedium calceolus* var. *parviflorum, Salix candida, Populus tremuloides, P. balsamifera, Betula glandulosa* var. *glandulifera, Alnus rugosa* var. *americana, Geocaulon lividum, Stellaria longifolia, Aquilegia canadensis, Caltha palustris, Ribes triste, R. hirtellum, Mitella nuda, Geum rivale, Rubus idaeus* var. *strigosus, R. pubescens, R. acaulis, Potentilla palustris, Vicia americana, Rhamnus alnifolia, Epilobium angustifolium, Cornus canadensis, Ledum groenlandicum, Pyrola assarifolia, Naumburgia thyrsiflora, Menyanthes trifoliata, Galium palustre, Senecio pauperculus,* and *Petasites sagittatus.*

### (3) THE BOREAL FOREST REGION

The Boreal Forest region of the province lies to the north of the Grassland region and merges gradually with the still more northerly Tundra-Forest region transitional between it and the arctic Tundra of extreme northeastern Manitoba. It is part of the great transcontinental conifer forest, characteristic of the Hudsonian Biotic province. A typical scene in this region is shown in the photograph (Plate VI A) taken on the Hayes River northeast of Knee Lake, about midway between Lake Winnipeg and Hudson Bay. Intensive glaciation has resulted in a thin soil cover, with considerable exposure of bedrock, this often forming parallel ridges separating poorly drained areas of muskeg. Black spruce and tamarack are the dominant trees of the muskeg. White spruce, aspen, balsam poplar, paper birch, and balsam fir form mixed stands in river valleys and around lakes, and extensive stands of jack-pine occur frequently on dry, rocky, upland sites, especially following fires.

Characteristic components of the muskeg forest are as follows: *Equisetum arvense, E. fluviatile, E. scirpoides, E. sylvaticum* var. *pauciramosum, Picea mariana, Larix laricina, Eriophorum angustifolium, E. viridicarinatum, Carex chordorrhiza, C. rostrata* var. *utriculata, C. diandra, C. limosa, C. aquatilis, C. leptalea, C. disperma, C. gynocrates, Luzula parviflora, Smilacina trifolia, Orchis rotundifolia, Habenaria hyperborea, Cypripedium* *passerinum, Salix myrtillifolia, S. planifolia, S. bebbiana, S. candida, S. pedicellaris* var. *hypoglauca, Myrica gale, Betula glandulosa, Alnus rugosa* var. *americana, Geocaulon lividum, Stellaria longifolia, Ranunculus gmelini* var. *hookeri, R. lapponicus, Caltha palustris, Coptis trifolia* var. *groenlandica, Drosera rotundifolia, Sarracenia purpurea, Mitella nuda, Ribes hudsonianum, Parnassia palustris* var. *neogaea, Rubus chamaemorus, R. acaulis, R. pubescens, Potentilla palustris, Empetrum nigrum, Rhamnus alnifolia, Viola palustris, Epilobium palustre, Oxycoccus microcarpus, O. quadripetalus, Vaccinium vitis-idaea* var. *minus, Pyrola asarifolia, Ledum groenlandicum, Chamaedaphne calyculata, Kalmia polifolia, Andromeda glaucophylla, Hippuris vulgaris, Galium trifidum, G. labradoricum, Lonicera villosa,* and *Petasites sagittatus.*

Characteristic of the more upland white spruce sites (Plate VI A) are the following: *Equisetum sylvaticum* var. *pauciramosum, E. arvense, Lycopodium complanatum, L. obscurum, Botrychium virginianum, Picea glauca, Abies balsamea, Carex deflexa, C. disperma, C. tenuiflora, C. deweyana, Luzula parviflora, Maianthemum canadense, Cypripedium acaule, Orchis rotundifolia, Habenaria obtusata, Corallorhiza trifida, Goodyera repens* var. *ophioides, Populus tremuloides, P. balsamifera, Salix bebbiana, S. planifolia, Betula papyrifera, B. papyrifera* var. *humilis, Arenaria lateriflora, Actaea rubra, Mitella nuda, Ribes hudsonianum, R. lacustre, R. glandulosum, R. triste, R. oxyacanthoides, R. hirtellum, Potentilla tridentata, Rubus pubescens, R. acaulis, Sorbus decora, Astragalus americanus, Vicia americana, Acer spicatum, Circaea alpina, Aralia nudicaulis, Sanicula marilandica, Cornus canadensis, C. stolonifera, Monotropa uniflora, Moneses uniflora, Chimaphila umbellata, Pyrola secunda, P. minor, P. virens, P. elliptica, P. asarifolia, P. grandiflora, Ledum groenlandicum, Gaultheria hispidula, Arctostaphyllos uva-ursi, Vaccinium angustifolium, Mertensia paniculata, Melampyrum lineare, Galium triflorum, Linnaea borealis* var. *americana, Symphoricarpos albus, Lonicera dioica* var. *glaucescens, L. involucrata,* and *Viburnum edule.*

Gravel-cobble beaches and floodplains of the Nelson-Hayes system harbour an interesting mixture of native and introduced species. Such a pioneer habitat is shown in Plate VI B, a photograph of the beach of Nelson River near Gillam Island, on which were found *Equisetum arvense, Juniperus communis* var. *depressa, Triglochin palustris, Hierochloe odorata, Glyceria striata, Festuca rubra* var. *arenaria, Beckmannia syzigachne, Poa alpigena, P. alpina, P. palustris, Trisetum spicatum* var. *molle, Deschampsia cespitosa* var. *glauca, Agrostis scabra, Agropyron trachycaulum, Carex scirpoidea, C. garberi, C. aquatilis, Juncus balticus* var. *littoralis, Sisyrinchium montanum, Habenaria hyperborea, Salix planifolia, S. pseudomonticola, S. pellita, S. myrtillifolia, Populus balsamifera, Betula glandulosa, Alnus rugosa* var. *americana, Polygonum viviparum, Anemone parviflora, A. canadensis, A. multifida, Thalictrum venulosum, Cardamine pratensis* var. *palustris, Parnassia palustris* var. *neogaea, Fragaria virginiana* var. *terrae-novae, Potentilla fruticosa, P. anserina* f. *sericea, Rosa acicularis, Astragalus goniatus, Oxytropis campestris* var. *varians, Lathyrus palustris, Vicia americana, Rhamnus alnifolia, Shepherdia canadensis, Elaeagnus commutata, Epilobium latifolium, Cornus stolonifera, Arctostaphylos uva-ursi* var. *adenotricha, Primula* *mistassinica, Castilleja raupii, Pedicularis groenlandica, Galium septentrionale, Aster johannensis, Achillea borealis, Artemisia tilesii, Solidago multiradiata, S. canadensis, Taraxacum lacerum, Senecio pauperculus, Erigeron hyssopifolius,* and *Tanacetum huronense.*

Similar habitats elsewhere along the Nelson-Hayes system had many of the above species, as well as the following additional ones: *Equisetum variegatum, E. palustre, Botrychium lunaria, Bromus ciliatus, Hordeum jubatum, Sphenopholis intermedia, Calamagrostis canadensis, C. inexpansa* var. *brevior, C. neglecta, Alopecurus aequalis, Elymus inovatus, Catabrosa aquatica, Carex lenticularis, C. aurea, C. lanuginosa, Eleocharis palustris, E. acicularis, Eriophorum scheuchzeri, E. angustifolium, Juncus dudleyi, J. tenuis, J. castaneus, J. nodosus, J. bufonius, J. albescens, Luzula parviflora, Smilacina stellata, Tofieldia glutinosa, Allium schoenoprasum* var. *sibiricum, Habenaria viridis* var. *interjecta, Salix bebbiana, S. lucida, S. lutea, S. candida, S. vestita, S. cordifolia* var. *callicarpaea, S. interior, S. calcicola, Polygonum amphibium* var. *stipulaceum, Rumex maritimus* var. *fueginus, R. mexicanus, Cerastium nutans, Stellaria longipes, Sagina nodosa, Ranunculus reptans, R. pensylvanicus, R. macounii, R. cymbalaria, Corydalis aurea, Erysimum cheiranthoides, Cardamine pensylvanica, Descurainia sophioides, Rorippa islandica* var. *hispida, R. islandica* var. *fernaldiana, Arabis hirsuta* var. *pycnocarpa, Ribes hudsonianum, Potentilla norvegica, Geum aleppicum* var. *strictum, Rubus pubescens, R. acaulis, R. idaeus* var. *strigosus, Hedysarum mackenzii, Geranium bicknellii, Epilobium angustifolium, Hippuris vulgaris, Heracleum lanatum, Sium suave, Carum carvi, Cicuta maculata, Primula incana, P. egaliksensis, Gentiana amarella, Mertensia paniculata, Stachys palustris* var. *pilosa, Mentha arvensis* var. *villosa, Moldavica parviflora, Rhinanthus borealis, Euphrasia arctica, Veronica peregrina* var. *xalapensis, Pinguicula vulgaria, Plantago major, Galium trifidum, Arnica alpina* ssp. *attenuata, Artemisia biennis, A. canadensis, Aster puniceus, Solidago graminifolia* var. *major, Prenanthes racemosa, Senecio congestus* var. *palustris,* and *Hieracium umbellatum.*

Aquatic and swamp habitats in the Boreal Forest region (and also, to a large degree, in other regions of the province) may be exemplified by Plate VII A, a photograph of the Lake Winnipeg shore north of Riverton, opposite Hecla Island. In the water and wetter parts of the swamp were found *Typha latifolia, Alisma triviale, Glyceria grandis, Beckmannia syzigachne, Alopecurus aequalis, Carex atherodes, C. aquatilis, Eleocharis palustris, E. acicularis, Scirpus validus, Lemna trisulca, L. minor, Polygonum amphibium* var. *stipulaceum* f. *fluitans, Callitriche palustris, Myriophyllum exalbescens, Hippuris vulgaris, Sium suave, Cicuta bulbifera, C. maculata, Utricularia vulgaris,* and *U. intermedia.* In more shallow water and on muddy ground were found *Poa pratensis, P. palustris, Hierochloe odorata, Hordeum jubatum, Agropyron repens* f. *aristatum, Calamagrostis canadensis, Carex bebbii, C. sartwellii, Iris versicolor, Polygonum persicaria, P. amphibium* var. *stipulaceum, Rumex maritimus* var. *fueginus, Atriplex patula* var. *hastata, Ranunculus cymbalaria, R. pensylvanicus, R. sceleratus, Rorippa islandica* var. *fernaldiana, Brassica kaber, Thlaspi arvense, Potentilla anserina, Epilobium glandulosum* var. *adenocaulon,* and *Galium palustre.*

Attention has already been drawn to the occurrence of numerous halophytic species in the low-lying alkaline parts of the southern prairies. Such species are also found around salt springs in the central part of the province, as illustrated by Plate VII B, a photograph of a salt marsh at Salt Point, Dawson Bay, Lake Winnipegosis, where the following halophytic species were found: *Triglochin maritimum, Distichlis stricta, Spartina gracilis, Puccinellia nuttalliana, Atriplex patula* var. *hastata, Salicornia europaea, Suaeda depressa, Spergularia marina, Ranunculus cymbalaria, Glaux maritima, Plantago maritima,* and *Aster pauciflorus.*

### (4) THE TUNDRA-FOREST REGION

The Tundra-Forest region is one of transition between the Boreal Forest to the south and the Tundra to the northeast. The characteristic alternation of black spruce in the depressions with typical tundra on the higher areas is well illustrated by Plate VIII A, a photograph taken at Nejanilini Lake, lat. 59° 22′ N., long. 97° 46′ W., about 120 miles west-northwest of Churchill. The following species were found in the black spruce stands: *Equisetum sylvaticum* var. *pauciramosum, Picea mariana, Larix laricina, Carex rariflora, Eriophorum scheuchzeri, Scirpus cespitosus* var. *callosus, Smilacina trifolia, Salix arctophila, Stellaria calycantha, Viola palustris, Epilobium palustre, Cornus canadensis, Chamaedaphne calyculata, Andromeda polifolia,* and *Galium trifidum. Carex deflexa, C. bigelowii,* and *Corydalis sempervirens* occurred in dry, rocky openings, and *Eriophorum spissum, E. angustifolium, Carex aquatilis, C. saxatilis, C. paupercula* var. *irrigua, Juncus filiformis, Luzula parviflora, Salix planiflolia, S. herbacea, Betula glandulosa, Polygonum viviparum, Ranunculus reptans, Potentilla palustris, Rubus acaulis, R. chamaemorus, Epilobium palustre, Oxycoccus microcarpus, Kalmia polifolia,* and *Pedicularis labradorica* were found near the edge of the lake and on marshy ground.

The following species were collected on the higher sites: *Lycopodium complanatum, L. annotinum* var. *pungens, Equisetum sylvaticum* var. *pauciramosum, Poa glauca, Calamagrostis canadensis* var. *scabra, C. canadensis* var. *robusta, Carex deflexa, C. brunnescens, C. canescens, C. bigelowii, C. capitata, C. saxatilis, Juncus filiformis, Luzula confusa, Betula papyrifera* var. *humilis, Geocaulon lividum, Ribes glandulosum, Potentilla norvegica, Rubus chamaemorus, Empetrum nigrum, Ledum groenlandicum, L. decumbens, Loiseleuria procumbens, Arctostaphylos alpina, Vaccinium uliginosum, V. vitis-idaea* var. *minus, Epilobium angustifolium,* and *E. angustifolium* f. *albiflorum.*

### (5) THE TUNDRA REGION

Plate VIII B illustrates the arctic tundra near Baralzon Lake at a position on the sixtieth parallel about 135 miles northwest of Churchill. The terrain is gently rolling, with typical xerophytic Barren Ground habitats, with numerous frost polygons on the higher levels alternating with areas of open muskeg in the depressions and around ponds. Less than one per cent of the terrain is wooded with scrub black spruce and tamarack.

Dry, rocky barrens and gravelly hillocks had the following flora: *Agrostis borealis, Poa glauca, Calamagrostis canadensis* var. *robusta, Deschampsia atropurpurea, Hierochloe alpina, Carex glacialis, C. deflexa, C. bigelowii, C. capitata, C. williamsii, Luzula multiflora* ssp. *frigida, L. wahlenbergii, L. confusa, Juncus albescens, Tofieldia pusilla, Betula glandulosa, Sagina cespitosa, Empetrum nigrum, Epilobium angustifolium, Diapensia lapponica,* *Arctostaphylos alpina, Loiseleuria procumbens, Ledum decumbens, Vaccinium vitis-idaea* var. *minus*, and *V. uliginosum* var. *alpinum*. Of these, *Carex williamsii, Juncus albescens*, and *Tofieldia pusilla* were especially characteristic of the stony, disturbed ground within frost polygons.

The wetter, hummocky, sedge-heath areas had the following flora: *Equisetum sylvaticum* var. *pauciramosum, Lycopodium selago* var. *appressum, L. annotinum* var. *pungens, Carex bigelowii, C. glacialis, C. rariflora, C. tenuiflora, C. canescens, C. saxatilis* var. *miliaris, C. chordorrhiza, C. stans, Eriophorum angustifolium, E. spissum, Scirpus cespitosus* var. *callosus, Juncus arcticus, Smilacina trifolia, Salix arctophila, S. planifolia, S. herbacea, Polygonum viviparum, Coptis trifolia* var. *groenlandica, Potentilla palustris* var. *parvifolia, Rubus chamaemorus, Ledum groenlandicum, Andromeda polifolia, Chamaedaphne calyculata, Vaccinium uliginosum* var. *alpinum, Pedicularis labradorica*, and *Pinguicula villosa*.

*Isoetes echinospora* var. *braunii* and *Arctophila fulva* were collected in shallow water, and *Alnus crispa, Stellaria monantha*, and *Petasites palmatus* were found along the lake shore. *Sparganium minimum* was collected in a small pond near the lake.

Only 83 species of vascular plants were found in the relatively uniform terrain of the Baralzon-Nejanilini area. On the other hand, the collections and published reports (listed elsewhere) for the coastal district in the vicinity of Churchill indicate a vascular flora of between 375 and 400 species. The collection made by Baldwin [1953] in the highly diversified habitats between Reindeer Lake and Nueltin Lake numbered about 220 species, a marked increase over the approximately 130 species collected in 1947 by Francis Harper on the Keewatin side of Nueltin Lake [Porsild, 1950a], and an indication that many of the forest species reach their northern limits between Reindeer and Nueltin lakes. River shore and rock outcrop habitats were absent in the Baralzon–Nejanilini area, in addition, of course, to the halophytic coastal habitat of Churchill.

## AFFINITIES OF THE MANITOBA FLORA

The following geographical subdivisions have been assigned to the plants treated in the systematic part of this work:

*Temperate circumpolar*: extending north to the southern boundary of the Northern Conifer Forest or of the Hudsonian Biotic Province (Gaspe to the north shore of Lake Superior, southern Manitoba and Saskatchewan, central Alberta and British Columbia); temperate Eurasia.

*Temperate American:* American part of the above range.

*Temperate eastern American:* American part of range east of approximately long. 100° W.

*Temperate western American:* American part of range west of approximately long. 100° W.

*(Subarctic-)temperate circumpolar, (Subarctic-)temperate American, (Subarctic-)temperate eastern American, (Subarctic-)temperate western American*: similar to the above subdivisions, but including southern Labrador, Newfoundland, and the northern parts of the western provinces.

*Subarctic-circumpolar:* extending north to the northern limit of the Northern Conifer Forest or Hudsonian Biotic Province (Newfoundland to middle Hudson Bay, Great Bear Lake, and southern Alaska); Eurasia.

*Subarctic-American:* American part of the above range.

*Subarctic-eastern American:* American part of range east of approximately long. 100° W.

*Subarctic western American:* American part of range west of approximately long. 100° W.

*(Arctic-)subarctic circumpolar, (Arctic-)subarctic American, (Arctic-)subarctic eastern American, (Arctic-)subarctic western American:* similar to the Arctic subdivisions, but excluding the Canadian Arctic Archipelago (with the exception of s. Baffin I.), n. Que., and n. Lab.

*Arctic circumpolar:* extending north of the tree-line, including coastal Labrador north of Hamilton Inlet, Ungava Bay, northernmost Quebec, Northwest Territories north of Chesterfield Inlet and Great Bear Lake, the islands of the Canadian Arctic Archipelago, and the north coasts of Yukon and Alaska to Seward Peninsula; arctic Eurasia.

*Arctic American:* American part of the above range.

*Arctic eastern American:* American part of range east of approximately long. 100° W.

*Arctic western American:* American part of range west of approximately long. 100° W.

The other terms employed in Table III, which summarizes the geographical affinities of the flora (the variety is included only when the main form is absent), are self-explanatory.

*Table III. Geographical Affinities of the Manitoba Flora*

| Subdivision | Species | Per cent of total species (1417) | Per cent of native species (1224) |
|---|---|---|---|
| Arctic circumpolar | 96 | 6·77 | 7·84 |
| Arctic American | 26 | 1·83 | 2·12 |
| Arctic eastern American | 3 | 0·21 | 0·24 |
| Arctic western American | 3 | 0·21 | 0·24 |
| (Arctic-)subarctic circumpolar | 58 | 4·09 | 4·73 |
| (Arctic-)subarctic American | 49 | 3·46 | 4·00 |
| (Arctic-)subarctic eastern American | 3 | 0·21 | 0·24 |
| (Arctic-)subarctic western American | 8 | 0·56 | 0·65 |
| Subarctic circumpolar | 84 | 5·93 | 6·86 |
| Subarctic American | 163 | 11·51 | 13·31 |
| Subarctic eastern American | 8 | 0·56 | 0·65 |
| Subarctic western American | 36 | 2·54 | 2·94 |
| (Subarctic-)temperate circumpolar | 23 | 1·62 | 1·87 |
| (Subarctic-)temperate American | 121 | 8·54 | 9·88 |
| (Subarctic-)temperate eastern American | 59 | 4·16 | 4·82 |
| (Subarctic-)temperate western American | 24 | 1·69 | 1·96 |
| Temperate circumpolar | 9 | 0·63 | 0·73 |
| Temperate American | 156 | 11·01 | 12·74 |
| Temperate eastern American | 125 | 8·82 | 10·21 |
| Temperate western American | 154 | 10·86 | 12·58 |
| Amphi-Atlantic | 16 | 1·12 | 1·30 |
| Tropical American | 3 | 0·21 | .............. |
| European, Asiatic, Eurasian | 190 | 13·34 | .............. |

In terms of longitudinal and latitudinal extensions, respectively, the foregoing table may be condensed as follows (Table IV):

*Table IV. Longitudinal and Latitudinal Extensions of Native Species*

| Longitudinal extension | Native species | Per cent of native species |
|---|---|---|
| Circumpolar | 270 | 22·05 |
| American (widespread) | 515 | 42·07 |
| Eastern American | 198 | 16·17 |
| Western American | 225 | 18·38 |
| Amphi-Atlantic | 16 | 1·30 |
| Latitudinal extension (including amphi-Atlantic) | | |
| Arctic | 135 | 11·02 |
| (Arctic-)subarctic | 119 | 9·72 |
| Subarctic | 294 | 24·01 |
| (Subarctic-)temperate | 231 | 18·87 |
| Temperate | 446 | 36·43 |

The sixteen amphi-Atlantic species are: Arctic (*Carex bigelowii, Arenaria humifusa, Sagina cespitosa, Saxifraga aizoides, Potentilla pulchella, Primula stricta,* and *Pedicularis flammea*); (Arctic-)subarctic (*Euphrasia arctica*); Subarctic (*Carex rufina, Spiranthes romanzoffiana,* and *Polygonum boreale*); (Subarctic-)temperate (*Najas flexilis, Carex paleacea,* and *Potamogeton epihydrus* var. *nuttallii*); Temperate (*Liparis loeselii* and *Myosurus minimus*). These are species that, in addition to having a more or less extensive distribution in at least the eastern part of North America, also occur in Europe but have a very large gap in Asia.

Fraser and Russell [1944] list approximately 1,500 species for Saskatchewan. This would probably be reduced to about the number (1,417) given for total species of Manitoba in the present work if a uniform species-concept were applied for both provinces; the higher proportion of prairie and cordilleran species in the Saskatchewan flora is largely compensated for by the higher proportion of arctic and eastern North American plants in that of Manitoba.

Stevens [1950] lists approximately 1,000 species for North Dakota, of which about 850 are native to the state. Of the native species, about 40 per cent are prairie species, according to Rudd [1951], whereas 15 per cent are widespread American or circumpolar species, 20 per cent eastern deciduous forest species, 15 per cent northern conifer forest species, 5 per cent Rocky Mountain species, and 5 per cent southwestern desert species.

Corresponding figures are not available for Ontario or Keewatin, but enough is known of the flora of these areas to support the statement that Manitoba is strategically situated in a zone of transition between northern and southern, and between eastern and western, floristic types.

## ADDITIONS TO THE FLORA

The 204 entities of the following three lists are here reported for the first time as constituents of the flora of Manitoba. They include 20 species or varieties accredited to the province in the general ranges given by Fernald [1950] and Gleason [1952].

*Botrychium matricariaefolium*
*Pellaea glabella*
*Puccinellia vaginata*
*Glyceria pulchella*
*Poa glaucifolia*
*P. cusickii*
*Arctophila fulva*
*Eragrostis cilianensis*
*Elymus interruptus*
*Oryzopsis micrantha*
*Stipa richardsonii*
*Aristida longiseta*
*Buchloë dactyloides*
*Andropogon hallii*
*Setaria verticillata*
*S. italica*
*Digitaria ischaemum*
*Echinochloa pungens* var. *wiegandii*
*Panicum linearifolium* var. *werneri*
*Eleocharis smallii*
*Rhynchospora capillacea*
*Eriophorum chamissonis*
*Kobresia simpliciuscula*
*Carex molesta*
*C. argyrantha*
*C. tonsa*
*C. garberi*
*C. blanda*
*C. castanea*
*C. paleacea*
*C. salina* var. *subspathacea*
*C. laeviconica*
*Tradescantia occidentalis*
*Juncus compressus*
*J. biglumis*
*J. canadensis*
*Luzula wahlenbergii*
*L. groenlandica*
*Allium schoenoprasum* var. *sibiricum*
*Iris pseudacorus*
*Populus alba*
*Salix pseudomonticola*
*S. athabascensis*
*S. scouleriana*
*Rumex utahensis*
*Fagopyrum sagittatum*
*F. tataricum*
*Polygonum interior*
*P. boreale*
*P. achoreum*
*Corispermum nitidum*
*C. simplicissimum*
*C. orientale* var. *emarginatum*
*Atriplex glabriuscula*
*Chenopodium pratericola*
*C. fremontii*
*C. berlandieri*
*C. strictum* ssp. *glaucophyllum*
*Amaranthus hybridus*
*Acnida tamariscina*
*Sagina cespitosa*
*Arenaria uliginosa*
*Dianthus barbatus*
*Delphinium ajacis*
*Hepatica americana*
*Anemone riparia*
*Ranunculus pallasii*
*Raphanus sativus*
*Hesperis matronalis*
*Rorippa sylvestris*
*Sedum telephium*
*Parnassia parviflora*
*Potentilla rivalis*
*P. plattensis*
*Crataegus punctata*
*Amelanchier humilis*
*Oxytropis bellii*
*Astragalus yukonis*
*A. linearis*
*Vicia villosa*
*Lathyrus tuberosus*
*Oxalis europaea*
*Geranium pratense*
*Euphorbia geyeri*
*Impatiens noli-tangere*
*Viola selkirkii*
*Epilobium leptophyllum*
*E. leptocarpum* var. *macounii*
*Zizia aptera*
*Thaspium barbinode*
*Daucus carota*
*Anethum graveolens*
*Vaccinium cespitosum*
*Diapensia lapponica*
*Primula incana*
*Steironema hybridum*
*Gentiana macounii*
*Cuscuta coryli*
*Borago officinalis*

## ADDITIONS TO THE FLORA—*Continued*

*Echium plantagineum*
*Myosotis arvensis*
*Asperugo procumbens*
*Allocarya californica*
*Dracocephalum formosius*
*Leonurus cardiaca*
*Stachys tenuifolia* var. *hispida*
*Salvia reflexa*
*Physalis pruinosa*
*Linaria dalmatica*
*Euphrasia hudsoniana*
*Odontites serotina*
*Plantago media*
*Galium labradoricum*
*G. palustre*
*Campanula rapunculoides*
*Aster modestus*
*A. pansus*
*A. johannensis*
*Antennaria petaloidea*
*Erigeron humilis*
*Gnaphalium uliginosum*
*Rudbeckia serotina*
*Matricaria chamomilla*
*Taraxacum lapponicum*
*Agoseris agrestis*

The following varieties, here listed as new to our flora, form the basis of the citations of their main forms from Manitoba in the literature:

*Lycopodium clavatum* var. *megastachyon*
*Ruppia maritima* var. *occidentalis*
*Phragmites communis* var. *berlandieri*
*Muhlenbergia glomerata* var. *cinnoides*
*Agrostis stolonifera* var. *major*
*Calamagrostis inexpansa* var. *brevior*
*Carex bipartita* var. *amphigena*
*Thalictrum sparsiflorum* var. *richardsonii*
*Draba reptans* var. *micrantha*
*Cardamine pratensis* var. *palustris*
*C. parviflora* var. *arenicola*
*Crataegus succulenta* var. *occidentalis*
*Polygala verticillata* var. *isocycla*
*Hypericum virginicum* var. *fraseri*
*Viola pensylvanica* var. *leiocarpa*
*Oenothera fruticosa* var. *linearis*
*Epigaea repens* var. *glabrifolia*
*Prunella vulgaris* var. *lanceolata*
*Galeopsis tetrahit* var. *bifida*
*Eupatorium maculatum* var. *bruneri*
*Solidago decumbens* var. *oreophila*
*S. graminifolia* var. *major*
*Lactuca canadensis* var. *longifolia*

The following varieties or subspecies, here listed as new to our flora, were already represented in the province by the main form or one or more additional varieties:

*Pteridium aquilinum* var. *pubescens*
*Sagittaria latifolia* var. *obtusa*
*Festuca rubra* var. *arenaria*
*Puccinellia vaginata* var. *paradoxa*
*Dupontia fisheri* var. *aristata*
*Agropyron smithii* var. *molle*
*A. repens* var. *subulatum*
*A. trachycaulum* var. *majus*
*A. trachycaulum* var. *glaucum*
*Lolium temulentum* var. *leptochaeton*
*Hordeum jubatum* var. *cespitosum*
*Elymus arenarius* var. *villosissimus*
*Agrostis stolonifera* var. *compacta*
*Echinochloa pungens* var. *microstachya*
*Panicum lanuginosum* var. *implicatum*
*P. depauperatum* var. *psilophyllum*
*Eriophorum chamissonis* var. *aquatile*
*Carex capillaris* var. *major*
*C. paupercula* var. *pallens*
*Juncus bufonius* var. *halophilus*
*J. castaneus* var. *pallidus*
*Populus balsamifera* var. *subcordata*
*Salix petiolaris* var. *rosmarinoides*
*S. humilis* var. *microphylla*
*Betula glandulosa* var. *glandulifera*
*Polygonum coccineum* var. *pratincola*
*Stellaria calycantha* var. *isophylla*
*Cerastium arvense* var. *viscidulum*
*C. alpinum* var. *glanduliferum*
*Anemone multifida* var. *richardsiana*

ADDITIONS TO THE FLORA—*Concluded*

*Ranunculus reptans* var. *ovalis*
*Ribes hirtellum* var. *saxosum*
*R. hirtellum* var. *calcicola*
*Potentilla palustris* var. *parvifolia*
*P. gracilis* var. *rigida*
*P. nivea* ssp. *chamissonis*
*Medicago lupulina* var. *glandulosa*
*Hedysarum alpinum* var. *philoscia*
*Vicia americana* var. *truncata*
*Lathyrus japonicus* var. *aleuticus*
*Oxalis stricta* var. *piletocarpa*
*Geranium carolinianum* var. *confertiflorum*
*Viola adunca* var. *minor*
*Vaccinium angustifolium* var. *hypolasium*
*V. angustifolium* var. *nigrum*
*Apocynum sibiricum* var. *cordigerum*
*Asclepias viridiflora* var. *lanceolata*
*A. viridiflora* var. *linearis*
*Lobelia spicata* var. *campanulata*
*Solidago hispida* var. *lanata*
*Artemisia ludoviciana* var. *pabularis*
*Cirsium arvense* var. *mite*
*C. drummondii* var. *acaulescens*
*Lactuca canadensis* var. *latifolia*
*Agoseris glauca* var. *dasycephala*

In addition to the above, first reports for the province of the following species and varieties were made by the writer in previous papers [1950, 1951, 1952]:

*Lycopodium annotinum* var. *acrifolium*
*Sparganium angustifolium*
*Poa alpigena*
*Calamagrostis canadensis* var. *scabra*
*Scirpus cespitosus* var. *callosus*
*Carex glacialis*
*C. bigelowii*
*Luzula confusa*
*Salix herbacea*
*Betula papyrifera* var. *humilis*
*Alnus rugosa* var. *americana*
*Nuphar variegatum*
*Sorbus decora*
*Oxycoccus quadripetalus*
*Arctostaphylos uva-ursi* var. *adenotricha*
*Arnica lonchophylla*

The following first reports for the province were made by Baldwin [1952], in the Reindeer Lake and Nueltin Lake areas of northwestern Manitoba:

*Dryopteris fragrans* var. *remotiuscula*
*Calamagrostis purpurascens*
*C. lapponica* var. *nearctica*
*Eleocharis acicularis* var. *submersa*
*Carex loliacea*
*C. supina* ssp. *spaniocarpa*
*C. rufina*
*C. pauciflora*
*Luzula spicata*
*Stellaria calycantha* var. *floribunda*
*Barbarea orthoceras*
*Rubus paracaulis*
*R. idaeus* var. *canadensis*
*Myriophyllum alterniflorum*
*Pyrola grandiflora* var. *canadensis*

## EXCLUDED SPECIES AND VARIETIES

Reports in the literature of the following for Manitoba are referable to a variety or varieties, the main form apparently being absent:

*Equisetum hyemale*
*Lycopodium clavatum*
*Dryopteris fragrans*
*Pteridium aquilinum*
*Athyrium filix-femina*
*Potamogeton alpinus*
*P. epihydrus*
*Phragmites communis*
*Trisetum spicatum*
*Muhlenbergia glomerata*
*Calamagrostis inexpansa*
*Zizania aquatica*
*Scirpus cespitosus*
*Carex bipartita*
*C. supina*
*Juncus balticus*
*J. alpinus*
*Smilax herbacea*
*Streptopus amplexifolius*
*S. roseus*
*Goodyera repens*
*Salix pedicellaris*
*Urtica dioica*
*Rumex maritimus*
*Polygonum amphibium*
*P. punctatum*
*Chenopodium glaucum*
*Anemone patens*
*A. quinquefolia*
*Thalictrum sparsiflorum*
*Ranunculus circinatus*
*Draba fladnizensis*
*D. incana*
*D. nemorosa*
*Cardamine pratensis*
*C. parviflora*
*Arabis holboellii*
*A. hirsuta*
*Parnassia palustris*
*Fragaria vesca*
*Geum macrophyllum*
*Chamaerhodos erecta*
*Rubus idaeus*
*Crataegus succulenta*
*Amorpha fruticosa*
*Oxytropis deflexa*
*Lathyrus japonicus*
*L. venosus*
*Polygala verticillata*
*Rhus radicans*
*Hypericum virginicum*
*Viola (eriocarpa) pensylvanica*
*Chimaphila umbellata*
*Epigaea repens*
*Vaccinium vitis-idaea*
*Fraxinus pennsylvanica*
*Phlox pilosa*
*Heliotropium curassavicum*
*Lappula redowskii*
*Scutellaria galericulata*
*Prunella vulgaris*
*Galeopsis tetrahit*
*Stachys palustris*
*Chelone glabra*
*Veronica peregrina*
*Gerardia tenuifolia*
*Linnaea borealis*
*Lonicera dioica*
*L. villosa*
*Lobelia spicata*
*Eupatorium maculatum*
*Solidago decumbens*
*Boltonia asteroides*
*Aster umbellatus*
*Erigeron acris*
*Ambrosia artemisiifolia*
*Artemisia ludoviciana*
*Arnica alpina*
*Lactuca canadensis*

Reports in the literature of the following have been referred to some other entity (the name of this appearing in brackets), either after an examination of existing specimens or, in their absence, on the basis of probability:

*Botrychium ternatum (B. multifidum* var. *intermedium)*
*B. ternatum* var. *lunarioides (B. multifidum* var. *intermedium)*
*B. obliquum (B. multifidum* var. *intermedium)*
*Polypodium vulgare (P. virginianum)*
*Pellaea atropurpurea (P. glabella)*
*Ruppia maritima* var. *longipes* (var. *occidentalis)*

## EXCLUDED SPECIES AND VARIETIES—*Continued*

*Potamogeton marinus* (*P. filiformis*)
*P. rufescens* (*P. alpinus* var. *tenuifolius*)
*P. lucens* (*P. alpinus* var. *tenuifolius*)
*P. zosterifolius* (*P. zosteriformis*)
*P. perfoliatus* (*P. richardsonii*)
*P. rutilus* (*P. strictifolius* var. *rutiloides*)
*Alisma plantago-aquatica* (*A. triviale*)
*Sagittaria engelmanniana* (*S. latifolia* f. *gracilis*)
*Vallisneria spiralis* (*V. americana*)
*Festuca octoflora* (*F. ovina* var. *saximontana*)
*F. ovina* var. *duriuscula* (*F. brachyphylla*)
*Bromus anomalus* (*B. porteri*)
*B. kalmii* (*B. porteri*)
*Puccinellia tenuiflora* (*P. nuttalliana*)
*Glyceria arundinacea* (*G. grandis*)
*Poa eminens* (*P. arctica*)
*P. laxa* (*P. arida*)
*Distichlis spicata* (*D. stricta*)
*Elymus dasystachys* (*E. arenarius* ssp. *mollis*)
*Sphenopholis nitida* (*S. intermedia*)
*S. pallens* (*S. intermedia*)
*Danthonia intermedia* (*D. spicata*)
*Oryzopsis canadensis* (*O. pungens*)
*Muhlenbergia sylvatica* (*M. racemosa*)
*M. depauperata* (*M. richardsonis*)
*Alopecurus geniculatus* (*A. aequalis*)
*Agrostis alba* (*A. stolonifera* var. *major*)
*A. exarata* (*A. stolonifera* var. *compacta*)
*A. hyemalis* (*A. scabra*)
*A. perennans* (*A. scabra*)
*Calamagrostis canadensis* var. *langsdorfii* (var. *scabra*)
*C. stricta* (*C. inexpansa* var. *brevior*)
*C. confinis* (*C. inexpansa* var. *brevior or C. neglecta*)
*C. rubescens* (*C. montanensis*)
*Arctagrostis poaeoides* (*A. latifolia*)
*Beckmannia erucaeformis* (*B. syzigachne*)
*Spartina cynosuroides* (*S. pectinata*)
*Panicum pauciflorum* (*P. oligosanthes* var. *scribnerianum*)
*Eleocharis acuminata* (*E. compressa*)
*E. tenuis* (*E. elliptica*)
*Scirpus maritimus* (*S. paludosus*)
*S. campestris* (*S. paludosus*)
*Eriophorum triquetrum* (*E. gracile*)
*E. polystachion* (*E. angustifolium*)
*E. latifolium* (*E. viridi-carinatum*)
*E. tenellum* (*E. gracile*)
*E. vaginatum* (*E. spissum*)
*E. "virginicum"* var. *opacum* (*E. brachyantherum*)
*Carex paradoxa* (*C. prairea*)
*C. disticha* (*C. sartwellii*)
*C. neurochlaena* (*C. amblyorhyncha*)
*C. heleonastes* (*C. amblyorhyncha*)
*C. gracilis* (*C. canescens* or *C. brunnescens*)
*C. echinata* var. *microstachys* (*C. interior*)
*C. festiva* (*C. festivella*)
*C. liddoni* (*C. praticola*)
*C. straminea* (*C. tenera*)
*C. albolutescens* (*C. cumulata* and *C. sartwellii*)
*C. straminea* var. *alata* (*C. cumulata*)
*C. tribuloides* (*C. projecta*)
*C. willdenowii* (*C. backii* or *C. saximontana*)
*C. varia* (*C. peckii*, *C. concinna*, and *C. pensylvanica* var. *digyna*)

*C. communis (C. peckii)*
*C. hassei (C. garberi)*
*C. debilis (C. vaginata)*
*C. oederi (C. viridula)*
*C. fuliginosa (C. atrofusca)*
*C. misandra (C. atrofusca)*
*C. filiformis (C. lasiocarpa* var. *americana)*
*C. alpina* var. *inferalpina (C. media)*
*C. atrata (C. raymondii)*
*C. stricta (C. aquatilis)*
*C. vulgaris (C. aquatilis)*
*C. goodenowii (C. aquatilis* var. *stans* or *C. bigelowii)*
*C. membranacea (C. rotundata)*
*C. tukermani (C. rostrata)*
*C. bullata (C. vesicaria, C. rostrata,* or *C. oligosperma)*
*C. lupulina (C. intumescens)*
*Tradescantia virginiana (T. occidentalis)*
*T. bracteata (T. occidentalis)*
*Juncus effusus (J. balticus* var. *littoralis)*
*J. articulatus (J. alpinus* var. *rariflorus)*
*J. brachycephalus (J. brevicaudatus)*
*J. dichotomus (J. tenuis)*
*J. polycephalus (J. nodosus* or *J. torreyi)*
*Luzula carolinae (L. acuminata)*
*L. campestris* var. *pallescens (L. multiflora)*
*Allium mutabile (A. textile)*
*Tofieldia palustris (T. pusilla)*
*Uvularia perfoliata (U. sessilifolia)*
*U. grandiflora (U. sessilifolia)*
*Trillium flexipes (T. cernuum* var. *macranthum)*
*Disporum lanuginosum (D. trachycarpum)*
*Polygonatum pubescens (P. canaliculatum)*
*Zigadenus glaucus (Z. elegans)*
*Z. chloranthus (Z. elegans)*
*Maianthemum bifolium (M. canadense* var. *interius)*
*Sisyrinchium angustifolium (S. montanum)*
*S. mucronatum (S. montanum)*
*S. campestre (S. montanum)*
*Cypripedium guttatum (C. passerinum)*
*Limnodorum tuberosum (Calopogon pulchellus)*
*Habenaria clavellata (H. obtusata)*
*Platanthera herbiola (Habenaria viridis* var. *bracteata)*
*Spiranthes cernua (S. romanzoffiana)*
*Listera convallarioides (L. borealis)*
*L. auriculata (L. borealis)*
*Populus manitobensis (P. deltoides)*
*P. acuminata (P. balsamifera)*
*P. candicans (P. balsamifera)*
*Salix erythrocoma (S. serissima)*
*S. rigida (S. lutea)*
*S. glaucophylla (S. lutea)*
*S. mackenziana (S. lutea)*
*S. discolor* var. *prinoides (S. discolor)*
*S. barclayi (S. myrtillifolia)*
*S. uva-ursi (S. myrtillifolia)*
*S. richardsonii (S. calcicola)*
*S. hookeriana (S. scouleriana)*
*S. chlorophylla (S. planifolia)*
*S. argyrocarpa* f. *serrata (S. arbusculoides)*
*Alnus viridis (A.crispa)*
*A. glutinosa (A. crispa)*
*A. incana (A. rugosa* var. *americana)*
*A. tenuifolia (A. rugosa* var. *americana)*

## EXCLUDED SPECIES AND VARIETIES—*Continued*

*Betula nana (B. glandulosa)*
*B. pumila (B. glandulosa* var. *glandulifera)*
*B. alba (B. papyrifera)*
*Quercus obtusiloba (Q. macrocarpa)*
*Comandra umbellata (C. richardsiana)*
*Rumex salicifolius (R. mexicanus)*
*R. persicarioides (R. maritimus* var. *fueginus)*
*Polygonum dumetorum (P. scandens)*
*P. tenue (P. douglasii)*
*P. fowleri (P. boreale)*
*P. maritimum (P. aviculare)*
*Salicornia europaea (S. rubra)*
*Salsola kali* var. *tragus* (var. *tenuifolia)*
*Chenopodium urbicum (C. album* and *Atriplex patula)*
*C. boscianum (C. berlandieri)*
*Allionia pilosa (Mirabilis hirsuta)*
*A. decumbens (M. hirsuta)*
*Spergularia media (S. marina)*
*Arenaria verna (A. rubella)*
*A. verna* var. *hirta (A. rubella)*
*A. stricta (A. dawsonensis)*
*Stellaria laeta (S. longipes, S. monantha,* and *S. ciliatosepala)*
*S. edwardsii (S. ciliatosepala)*
*S. longipes* var. *minor (S. monantha* or *S. ciliatosepala)*
*S. gracilis (S. crassifolia)*
*Nuphar luteum (N. microphyllum)*
*N. pumilum (N. microphyllum)*
*N. advena (N. variegatum)*
*Aquilegia coccinea (A. canadensis)*
*A. latiuscula (A. canadensis)*
*Delphinium azureum* var. *(D. virescens)*
*Hepatica triloba (H. americana)*
*Anemone dichotoma (A. canadensis)*
*A. nemorosa (A. quinquefolia* var. *interior)*
*Actaea pachypoda (A. rubra* f. *neglecta)*
*Thalictrum cornuti (T. dasycarpum)*
*T. purpurascens (T. dasycarpum)*
*T. dioicum (T. venulosum)*
*T. occidentale (T. confine)*
*Ranunculus amphibius (R. aquatilis* var. *capillaceus)*
*R. aquatilis* var. *stagnalis (R. aquatilis* var. *capillaceus)*
*R. longirostris (R. circinatus* var. *subrigidus)*
*R. multifidus (R. gmelinii* var. *hookeri)*
*R. multifidus* var. *repens (R. gmelini* var. *hookeri)*
*R. hispidus (R. pensylvanicus* or *R. macounii)*
*Polanisia trachysperma (P. graveolens)*
*Draba arabisans (D. glabella)*
*D. hirta (D. glabella)*
*D. caroliniana (D. reptans* var. *micrantha)*
*Lesquerella arenosa (L. ludoviciana)*
*L. spathulata (L. ludoviciana)*
*Lepidium intermedium (L. densiflorum)*
*L. virginicum (L. densiflorum)*
*Iodanthus pinnatifidus (Raphanus sativus)*
*Brassica nigra (B. kaber)*
*Sophia intermedia (Descurainia pinnata* var. *brachycarpa)*
*Sisymbrium canescens (Descurainia pinnata* var. *brachycarpa)*
*Descurainia hartwegiana (D. richardsonii)*
*Erysimum parviflorum (E. inconspicuum)*
*E. lanceolatum (E. inconspicuum)*
*Nasturtium palustre (Rorippa islandica* var. *fernaldiana)*
*N. officinale (Rorippa islandica* var. *fernaldiana)*
*Radicula palustris (Rorippa islandica* var. *fernaldiana)*

## EXCLUDED SPECIES AND VARIETIES—*Continued*

*Rorippa sinuata (R. islandica* var. *fernaldiana)*
*Barbarea praecox (B. orthoceras)*
*B. vulgaris (B. orthoceras)*
*B. vulgaris* var. *arcuata (B. orthoceras)*
*B. stricta (B. orthoceras)*
*Cardamine douglassii (C. pratensis* var. *angustifolia)*
*C. hirsuta (C. pensylvanica)*
*Arabis confinis (A. drummondii)*
*A. bourgovii (A. drummondii)*
*A. petraea (A. arenicola* var. *pubescens)*
*A. nuttallii (A. arenicola* var. *pubescens)*
*A. pendulocarpa (A. holboellii* var. *collinsii)*
*A. canadensis (A. holboellii* var. *collinsii)*
*A. ovata (A. hirsuta* var. *pycnocarpa)*
*Cakile edentula (Chrysanthemum arcticum)*
*Drosera intermedia (D. linearis)*
*D. anglica (D. linearis)*
*Chrysosplenium alternifolium (C. tetrandrum)*
*C. americanum (C. tetrandrum)*
*Parnassia caroliniana (P. glauca)*
*Saxifraga aizoon (S. tricuspidata)*
*S. cernua (S. rivularis)*
*Heuchera hispida (H. richardsonii)*
*Ribes rubrum (R. triste)*
*R. cynosbati (R. oxyacanthoides)*
*R. setosum (R. oxyacanthoides)*
*Grossularia setosa (Ribes hirtellum)*
*Spiraea salicifolia (S. alba)*
*Agrimonia gryposepala (A. striata)*
*A. eupatoria (A. striata)*
*Dryas octopetala (D. integrifolia)*
*Sieversia ciliata (Geum triflorum)*
*Potentilla supina (P. paradoxa)*
*P. diversifolia (P. norvegica)*
*P. dissecta (P. norvegica)*
*P. hippiana* var. *pulcherrima (P. gracilis* var. *pulcherrima)*
*P. filipes (P. gracilis* var. *pulcherrima)*
*P. nivea* var. *subquinata (P. nivea)*
*P. pensylvanica* var. *platyloba (P. pensylvanica* var. *pectinata)*
*Argentina subarctica (Potentilla egedii* var. *groenlandica)*
*Rubus arcticus (R. acaulis)*
*R. occidentalis (R. idaeus* var.*)*
*R. idaeus* var. *aculeatissimus* (var. *canadensis)*
*Prunus melanocarpa (P. virginiana)*
*Crataegus tomentosa (C. punctata)*
*C. coccinea (C. succulenta* var. *occidentalis)*
*C. crus-galli (C. succulenta* var. *occidentalis)*
*Amelanchier canadensis (A. alnifolia)*
*A. canadensis* var. *oblongifolia (A. alnifolia)*
*A. canadensis* var. *botryapium (A. alnifolia)*
*A. spicata (A. humilis)*
*A. mucronata (A. humilis)*
*Pyrus americana (Sorbus decora)*
*P. "aucuparida" (Sorbus decora)*
*P. sambucifolia (Sorbus decora)*
*Sorbus scopulina (S. decora)*
*Trifolium procumbens (Medicago lupulina)*
*Oxytropis hudsonica (O. campestris* var. *varians)*
*O. leucantha (O. campestris* var. *varians)*
*O. glabrata (O. campestris* var. *varians)*
*O. monticola (O. campestris* var. *johannensis)*
*Astragalus carolinianus (A. canadensis)*
*A. hypoglottis (A. goniatus)*

## EXCLUDED SPECIES AND VARIETIES—*Continued*

*A. frigidus (A. americanus)*
*Tium drummondii (Oxytropis deflexa* var. *sericea)*
*Hedysarum boreale (H. alpinum* var. *americanum)*
*Vicia sativa (V. angustifolia)*
*Linum perenne (L. lewisii)*
*L. pratense (L. lewisii)*
*Oxalis acetosella (O. montana)*
*Geranium maculatum (G. pratense)*
*G. strigosum (G. pratense)*
*Euphorbia maculata (E. glyptosperma)*
*E. lucida (E. esula)*
*Callitriche anceps (C. palustris)*
*Rhus toxicodendron (R. radicans* var. *rydbergii)*
*Impatiens pallida (I. capensis* f. *immaculata)*
*Ceanothus americanus (C. ovatus)*
*Vitis palmata (V. riparia)*
*V. vulpina (V. riparia)*
*Malva neglecta (M. rotundifolia)*
*Lechea stricta (L. intermedia)*
*Helianthemum canadense (H. bicknellii)*
*Viola pedata (V. pedatifida)*
*V. delphinifolia (V. pedatifida)*
*V. septentrionalis (V. sororia)*
*V. cucullata (V. sororia)*
*V. canadensis (V. rugulosa)*
*Mamillaria missouriensis (M. vivipara)*
*Epilobium tetragonum (E. glandulosum* var. *adenocaulon)*
*E. lineare (E. leptophyllum)*
*Oenothera pratensis (O. fruticosa)*
*O. albicaulis (O. nuttallii)*
*Myriophyllum spicatum (M. exalbescens)*
*Hippuris maritima (H. tetraphylla)*
*Aralia spinosa (A. hispida)*
*Osmorhiza claytoni (O. longistylis)*
*Zizia cordata (Z. aptera)*
*Cicuta virosa (C. mackenzieana)*
*C. occidentalis (C. mackenzieana)*
*Thaspium trifoliatum (Zizia aptera)*
*Pyrola rotundifolia* var. *pumila (P. grandiflora)*
*Oxycoccus palustris (O. quadripetalus)*
*Primula farinosa (P. incana* and *P. stricta)*
*Androsace diffusa (A. septentrionalis* var. *puberulenta)*
*Steironema quadriflorum (Gratiola neglecta)*
*Fraxinus pubescens (F. pennsylvanica* var. *austini)*
*F. campestris (F. pennsylvanica* var. *austini* and var. *subintegerrima)*
*Gentiana amarella* var. *stricta (G. amarella)*
*G. tonsus (G. macounii)*
*G. serrata (G. macounii)*
*Acerates lanuginosa (Asclepias viridiflora* var. *lanceolata)*
*A. tuberosa (Asclepias viridiflora* var. *lanceolata)*
*A. angustifolia (Asclepias viridiflora* var. *linearis)*
*Convolvulus interior (C. sepium)*
*Cuscuta arvensis (C. campestris)*
*Phlox aristata (P. pilosa* var. *fulgida)*
*P. canescens (P. hoodii)*
*Lycopsis arvensis (Borago officinalis)*
*Onosmodium hispidum (O. occidentale)*
*O. virginicum (O. occidentale)*
*Lappula deflexa (Hackelia americana)*
*L. heterosperma (L. redowskii* var. *occidentalis)*
*Echinospermum patulum (Lappula redowskii* var. *occidentalis)*
*Mertensia lanceolata (M. paniculata)*

## EXCLUDED SPECIES AND VARIETIES—*Continued*

*M. pilosa (M. paniculata)*
*Symphytum officinale (Mertensia paniculata)*
*Teucrium canadense (T. occidentale)*
*Stachys aspera (S. palustris* var. *pilosa* and *S. tenuifolia* var. *hispida)*
*Lycopus lucidus (L. asper)*
*Physalis lanceolata (P. virginiana)*
*P. heterophylla (P. virginiana)*
*Linaria macedonica (L. dalmatica)*
*Penstemon pubescens (P. albidus)*
*P. acuminatus (P. albidus)*
*P. eriantherus (P. albidus)*
*Gratiola virginiana (G. neglecta)*
*Veronica persica (V. polita)*
*V. anagallis (V. salina)*
*V. anagallis-aquatica (V. salina)*
*Agalinis paupercula* var. *borealis (Gerardia aspera)*
*Collinsia parviflora (Gerardia tenuifolia* var. *parviflora)*
*Castilleja acuminata (C. raupii)*
*C. pallida (C. raupii)*
*C. pallida* ssp. *elegans (C. raupii)*
*C. pallida* var. *septentrionalis (C. raupii)*
*C. rhexifolia (C. miniata* and *C. raupii)*
*Euphrasia officinalis (E. arctica)*
*Alectorolophus minor (Rhinanthus borealis)*
*Pedicularis wlassoviana (P. parviflora)*
*P. macrodontis (P. parviflora)*
*P. arctica (P. sudetica)*
*Plantago asiatica (P. major)*
*Houstonia ciliolata (H. longifolia)*
*Galium boreale (G. septentrionale)*
*G. claytoni (G. trifidum)*
*Sambucus racemosa (S. pubens)*
*Symphoricarpos racemosus (S. albus)*
*Lonicera canadensis (L. oblongifolia)*
*L. parviflora (L. dioica* var. *glaucescens)*
*L. hirsuta (L. dioica* var. *glaucescens)*
*L. prolifera (L. dioica* var. *glaucescens)*
*L. caerulea (L. villosa* var. *solonis)*
*L. caerulea* var. *villosa (L. villosa* var. *solonis)*
*Viburnum opulus (V. trilobum)*
*V. cassinoides (V. lentago)*
*V. pubescens (V. rafinesquianum)*
*Campanula scheuchzeri (C. rotundifolia)*
*Lobelia inflata (L. spicata* var. *hirtella)*
*Eupatorium purpureum (E. maculatum* var. *bruneri)*
*Liatris scariosa (L. ligulistylis)*
*L. aspera (L. ligulistylis)*
*Solidago uliginosa (S. purshii)*
*S. procera (S. canadensis)*
*S. lanceolata (S. graminifolia* var. *major)*
*S. tenuifolia (S. graminifolia* var. *major)*
*Aster divaricatus (A. macrophyllus)*
*A. lowrieanus (A. ciliolatus)*
*A. anomalus (A. ciliolatus)*
*A. junceus (A. junciformis)*
*A. nemoralis (A. junciformis)*
*A. novi-belgii (A. praealtus)*
*A. paniculatus (A. simplex)*
*A. ericoides (A. pansus)*
*Townsendia sericea (T. exscapa)*
*Erigeron jucundus (E. acris* var. *asteroides)*
*E. bellidifolius (E. philadelphicus)*
*E. annuus (E. strigosus)*

## EXCLUDED SPECIES AND VARIETIES—*Continued*

*E. pumilus (E. strigosus)*
*Antennaria dioica (A. rosea)*
*Gnaphalium obtusifolium (Anaphalis margaritacea)*
*G. palustre (G. uliginosum)*
*Franseria acanthicarpa (Ambrosia psilostachya)*
*Rudbeckia hirta (R. serotina)*
*R. fulgida (R. serotina)*
*Ratibida pinnata (Rudbeckia laciniata)*
*Helianthus nuttallii (H. maximiliani)*
*H. fascicularis (H. maximiliani)*
*H. utahensis (H. maximiliani)*
*H. grosseserratus (H. giganteus)*
*H. doronicoides (H. tuberosus* var. *subcanescens)*
*H. divaricatus (Heliopsis helianthoides* var. *scabra)*
*Bidens connata (B. cernua)*
*B. laevis (B. cernua)*
*Gaillardia pinnatifida (G. aristata)*
*Achillea subalpina (A. borealis)*
*Omalanthus camphoratus (Tanacetum huronense)*
*Artemisia tilesii* var. *elatior (A. tilesii)*
*A. vulgaris* var. *heterophylla (A. longifolia)*
*A. purshiana (A. ludoviciana* var. *gnaphalodes)*
*Petasites frigidus (P. vitifolius)*
*Nardosmia corymbosa (P. vitifolius)*
*Arnica mollis (A. chamissonis* ssp. *foliosa)*
*A. angustifolia (A. alpina* ssp. *attenuata)*
*Senecio jacobaea (S. eremophilus)*
*S. willingii (S. plattensis)*
*S. aureus* var. *balsamitae (S. pauperculus)*
*S. aureus* var. *borealis (S. pauperculus)*
*S. lugens (S. pauperculus)*
*S. lugens* var. *parryi (S. pauperculus)*
*Cineraria integrifolia (S. pauperculus)*
*Cirsium hillii (C. drummondii)*
*C. altissimum (C. discolor)*
*C. undulatum (C. flodmanii)*
*C. undulatum* var. *megacephalum (C. flodmanii)*
*Onopordum acanthium (Cirsium drummondii)*
*Taraxacum officinale* var. *alpinum (T. lacerum)*
*T. latilobum (T. officinale)*
*Lactuca spicata (L. biennis)*
*L. virosa (L. scariola* f. *integrifolia)*
*L. hirsuta (L. ludoviciana)*
*Mulgedium acuminatum (Lactuca pulchella)*
*Crepis biennis (C. tectorum)*
*Prenanthes alata (P. alba)*
*P. altissima (P. alba)*
*Hieracium canadense (H. umbellatum)*

The writer is unable to confirm reports of the following from Manitoba, the proper referents of which are too doubtful to warrant the venture of an opinion. Some may eventually prove admissible to our flora.

*Lycopodium lucidulum*
*Selaginella (apus) apoda*
*Osmunda regalis*
*O. cinnamomea*
*Dryopteris marginalis*
*D. filix-mas*
*Woodsia oregana*
*Asplenium trichomanes*
*Marsilea mucronata*
*Juniperus virginiana*
*Sparganium androcladum*
*Zostera marina*
*Potamogeton spirillus*
*P. amplifolius*
*Bromus secalinus*
*B. breviaristatus*
*Festuca vivipara*
*Puccinellia angustata*
*P. pumila*
*Glyceria fluitans*
*G. pallida*
*Poa flexuosa*

## EXCLUDED SPECIES AND VARIETIES—*Concluded*

*P. nervosa*
*P. secunda*
*P. trivialis*
*Milium effusum*
*Aristida basiramea*
*Alopecurus alpinus*
*Bouteloua hirsuta*
*Munroa squarrosa*
*Cyperus esculentus*
*C. filiculmis*
*Eriophorum virginicum*
*Carex cephalophora*
*C. panicea*
*C. plantaginea*
*Juncus militaris*
*J. stygius* var. *americanus*
*Trillium undulatum*
*T. erectum*
*Lilium michiganense*
*L. canadense*
*Zigadenus gramineus*
*Habenaria lacera*
*H. psycodes*
*H. fimbriata*
*Goodyera tesselata*
*Aplectrum hyemale*
*Salix nigra*
*S. glauca*
*S. (anglorum) arctica*
*S. cordata*
*Comptonia peregrina*
*Betula (papyrifera* var.*) cordifolia*
*B. caerulea*
*B. lenta*
*B. pendula*
*B. lutea*
*Quercus ellipsoidalis*
*Q. palustris*
*Q. rubra*
*Chenopodium bonus-henricus*
*Sarcobatus vermiculatus*
*Arenaria groenlandica*
*Lychnis apetala* var. *elatior*
*Silene acaulis*
*Paronychia depressa*
*P. sessiliflora*
*Brasenia schreberi*
*Clematis verticillaris*
*Ranunculus recurvatus*
*Lepidium sativum*
*Brassica hirta*
*Diplotaxis tenuifolia*
*Eruca sativa*
*Mitella diphylla*
*Penthorum sedoides*
*Spiraea tomentosa*
*Potentilla nivea* var. *macrophylla*
*Crataegus douglasii*
*Amelanchier sanguinea*
*Physocarpus opulifolius*
*Astragalus neglectus*
*Lathyrus japonicus* var. *parviflorus*
*L. pratensis*
*Tephrosia virginiana*
*Geranium robertianum*
*Polygala polygama*
*Euphorbia helioscopia*
*E. platyphylla*
*Callitriche heterophylla*
*Acer pensylvanicum*
*A. saccharum*
*A. rubrum*
*Hypericum pyramidatum*
*H. ascyron*
*H. ellipticum*
*H. perforatum*
*H. mutilum*
*H. quinquenervium*
*Circaea quadrisulcata*
*Epilobium coloratum*
*E. strictum*
*Oenothera cespitosa*
*Lavauxia triloba*
*L. flava*
*Isnardia palustris*
*Panax quinquefolium*
*Oplopanax horridus*
*Osmorhiza (divaricata) chilensis*
*Phellopterus montanus*
*Kalmia angustifolia*
*Oxycoccus macrocarpus*
*Cassiope tetragona*
*Gaylussacia baccata*
*Centunculus minimus*
*Convolvulus spithamaeus*
*Hackelia floribunda*
*Cryptantha crassisepala*
*C. bradburiana*
*C. macounii*
*Calamintha clinopodium*
*Clinopodium vulgare*
*Veronica serpyllifolia*
*V. sessilifolia*
*Scrophularia marilandica*
*Utricularia gibba*
*U. cornuta*
*Plantago rugelii*
*Valeriana ciliata*
*V. officinalis*
*Lobelia dortmanna*
*Solidago rugosa*
*S. ulmifolia*
*S. speciosa*
*Stenotus armerioides*
*Haplopappus lanceolatus*
*Aster conspicuous*
*A. vimineus*
*A. paludosus*
*Bellis perennis*
*Erigeron trifidus*
*E. uniflorus*
*Antennaria alpina*
*A. sedoides*
*Coreopsis palmata*
*C. delphinifolia*
*Tragopogon porrifolius*
*Hieracium venosum*

## TABULAR CLASSIFICATION

(Plants represented by a subspecies or variety only, the main form being absent, are included in the "species" column).

| Families | Genera | Species | | Varieties | |
|---|---|---|---|---|---|
| | | Nat. | Int. | Nat. | Int. |
| **PTERIDOPHYTA** | (16) | (41) | | (4) | |
| Equisetaceae | 1 | 9 | — | — | — |
| Lycopodiaceae | 1 | 5 | — | 3 | — |
| Selaginellaceae | 1 | 2 | — | — | — |
| Isoetaceae | 1 | 1 | — | — | — |
| Ophioglossaceae | 1 | 4 | — | — | — |
| Osmundaceae | 1 | 1 | — | — | — |
| Polypodiaceae | 10 | 19 | — | 1 | — |
| GYMNOSPERMAE | (7) | (11) | — | (1) | — |
| Taxaceae | 1 | 1 | — | — | — |
| Pinaceae | 6 | 10 | — | 1 | — |
| MONOCOTYLEDONEAE | (110) | (390) | (30) | (42) | (2) |
| Typhaceae | 1 | 1 | — | — | — |
| Sparganiaceae | 1 | 5 | — | — | — |
| Zosteraceae | 3 | 18 | — | 2 | — |
| Najadaceae | 1 | 1 | — | — | — |
| Juncaginaceae | 2 | 3 | — | — | — |
| Alismataceae | 2 | 5 | — | 1 | — |
| Hydrocharitaceae | 2 | 2 | — | — | — |
| Gramineae | 53 | 114 | 27 | 22 | 2 |
| Cyperaceae | 7 | 159 | — | 10 | — |
| Araceae | 4 | 4 | — | — | — |
| Lemnaceae | 2 | 3 | — | — | — |
| Commelinaceae | 1 | 1 | — | — | — |
| Juncaceae | 2 | 23 | 1 | 3 | — |
| Liliaceae | 14 | 21 | 1 | 3 | — |
| Amaryllidaceae | 1 | 1 | — | — | — |
| Iridaceae | 2 | 2 | 1 | — | — |
| Orchidaceae | 12 | 27 | — | 1 | — |
| DICOTYLEDONEAE | (362) | (782) | (163) | (71) | (4) |
| Salicaceae | 2 | 32 | 1 | 4 | — |
| Myricaceae | 1 | 1 | — | — | — |
| Betulaceae | 4 | 8 | — | 2 | — |
| Fagaceae | 1 | 1 | — | — | — |
| Ulmaceae | 2 | 2 | — | — | — |
| Cannabinaceae | 1 | 1 | — | — | — |
| Urticaceae | 3 | 3 | 1 | — | — |
| Santalaceae | 2 | 3 | — | — | — |
| Loranthaceae | 1 | 2 | — | — | — |
| Aristolochiaceae | 1 | 1 | — | — | — |
| Polygonaceae | 4 | 22 | 9 | 2 | — |
| Chenopodiaceae | 11 | 21 | 6 | 1 | — |
| Amaranthaceae | 2 | 3 | 2 | — | — |
| Nyctaginaceae | 1 | 2 | — | — | — |

## TABULAR CLASSIFICATION—*Continued*

| Families | Genera | Species |  | Varieties |  |
|---|---|---|---|---|---|
|  |  | Nat. | Int. | Nat. | Int. |
| DICOTYLEDONEAE—*Continued* |  |  |  |  |  |
| Portulacaceae | 2 | 1 | 1 | — | — |
| Caryophyllaceae | 11 | 25 | 11 | 5 | — |
| Ceratophyllaceae | 1 | 1 | — | — | — |
| Nymphaeaceae | 2 | 4 | — | — | — |
| Ranunculaceae | 11 | 39 | 3 | 6 | — |
| Berberidaceae | 1 | 1 | — | — | — |
| Menispermaceae | 1 | 1 | — | — | — |
| Papaveraceae | 5 | 4 | 2 | — | — |
| Capparidaceae | 2 | 2 | — | — | — |
| Cruciferae | 28 | 35 | 26 | 3 | 1 |
| Resedaceae | 1 | — | 1 | — | — |
| Sarraceniaceae | 1 | 1 | — | — | — |
| Droseraceae | 1 | 2 | — | — | — |
| Crassulaceae | 1 | — | 1 | — | — |
| Saxifragaceae | 6 | 21 | — | 2 | — |
| Rosaceae | 13 | 52 | 1 | 9 | — |
| Leguminosae | 16 | 44 | 12 | 7 | 1 |
| Linaceae | 1 | 3 | 1 | — | — |
| Oxalidaceae | 1 | 2 | — | 1 | — |
| Geraniaceae | 2 | 2 | 3 | 1 | — |
| Polygalaceae | 1 | 3 | — | — | — |
| Euphorbiaceae | 1 | 3 | 3 | — | — |
| Callitrichaceae | 1 | 2 | — | — | — |
| Empetraceae | 1 | 1 | — | — | — |
| Anacardiaceae | 1 | 2 | — | — | — |
| Celastraceae | 1 | 1 | — | — | — |
| Aceraceae | 1 | 2 | — | — | — |
| Balsaminaceae | 1 | 2 | — | — | — |
| Rhamnaceae | 2 | 2 | — | — | — |
| Vitaceae | 2 | 3 | — | — | — |
| Tiliaceae | 1 | 1 | — | — | — |
| Malvaceae | 3 | 1 | 3 | — | — |
| Guttiferae | 1 | 3 | — | — | — |
| Cistaceae | 3 | 3 | — | — | — |
| Violaceae | 1 | 14 | — | 1 | — |
| Loasaceae | 1 | 1 | — | — | — |
| Cactaceae | 2 | 3 | — | — | — |
| Elaeagnaceae | 2 | 3 | — | — | — |
| Lythraceae | 1 | — | 1 | — | — |
| Onagraceae | 4 | 16 | — | 2 | — |
| Haloragaceae | 1 | 3 | — | — | — |
| Hippuridaceae | 1 | 2 | — | — | — |
| Araliaceae | 1 | 3 | — | — | — |
| Umbelliferae | 16 | 18 | 5 | — | — |
| Cornaceae | 1 | 5 | — | — | — |
| Pyrolaceae | 4 | 10 | — | 2 | — |
| Ericaceae | 12 | 22 | — | 4 | — |
| Diapensiaceae | 1 | 1 | — | — | — |
| Primulaceae | 8 | 13 | — | 1 | — |
| Oleaceae | 1 | 2 | — | 1 | — |
| Gentianaceae | 4 | 13 | — | — | — |
| Apocynaceae | 1 | 3 | — | 2 | — |
| Asclepiadaceae | 1 | 6 | — | 2 | — |
| Convolvulaceae | 2 | 6 | 1 | — | — |
| Polemoniaceae | 2 | 3 | — | — | — |
| Hydrophyllaceae | 3 | 4 | — | — | — |
| Boraginaceae | 12 | 11 | 8 | — | — |
| Verbenaceae | 1 | 2 | — | — | — |
| Labiatae | 17 | 17 | 9 | — | — |
| Solanaceae | 4 | 5 | 2 | — | — |
| Scrophulariaceae | 20 | 37 | 7 | — | — |
| Orobanchaceae | 1 | 2 | — | — | — |
| Lentibulariaceae | 2 | 5 | — | — | — |

## TABULAR CLASSIFICATION—*Concluded*

| Families | Genera | Species | | Varieties | |
|---|---|---|---|---|---|
| | | Nat. | Int. | Nat. | Int. |
| DICOTYLEDONEAE—*Concluded* | | | | | |
| Phrymaceae | 1 | 1 | — | — | — |
| Plantaginaceae | 1 | 4 | 3 | — | — |
| Rubiaceae | 2 | 8 | 1 | — | — |
| Caprifoliaceae | 6 | 14 | 1 | — | — |
| Adoxaceae | 1 | 1 | — | — | — |
| Valerianaceae | 1 | 1 | — | — | — |
| Dipsacaceae | 1 | — | 1 | — | — |
| Cucurbitaceae | 2 | 1 | 1 | — | — |
| Campanulaceae | 2 | 7 | 1 | 1 | — |
| Compositae | 55 | 144 | 34 | 12 | 2 |
| Totals | 495 | 1,224 | 193 | 118 | 6 |

| | |
|---|---|
| Families | 113 |
| Genera | 495 |
| Species | 1,417 |
| Subspecies and varieties | 124 |

# SYSTEMATIC SECTION

## ARTIFICIAL KEY TO THE FAMILIES OF VASCULAR PLANTS OF MANITOBA

## PTERIDOPHYTA

*Plants without true flowers, reproducing by spores (without an embryo) borne in sporangia on the side of the leaves, in the leaf axils, or in terminal spike-like cones.*

1. Stems conspicuously jointed, mostly hollow; leaves reduced to scales, these united at base into nodal sheaths; sporangia borne in terminal spike-like cones........................1. *Equisetaceae*

1. Stems not conspicuously jointed.
  2. Leaves linear.
    3. Stem short, corm-like, crowned by a rosette of quill-like leaves; aquatic plant....4. *Isoëtaceae*
    3. Stem elongate, covered by scale-like overlapping leaves; terrestrial plants.
      4. Leaves eligulate; spores uniformly minute, the sporangia borne either in the upper axil of ordinary leaves or in terminal spikes or strobiles, these round in cross-section..........................2. *Lycopodiaceae*
      4. Leaves ligulate; spores of two kinds, the sporangia borne in terminal 4-sided strobiles..........................3. *Selaginellaceae*
  2. Leaves (fronds) broad, the fertile ones bearing sporangia on the under side, or the fertile ones sometimes much reduced.
    5. Fertile fronds (or their fertile portions) similar to the sterile (except in *Pteretis* and *Onoclea*, with sporangia covered by the rolled-up pinnules to form globular berry-like divisions)..........................7. *Polypodiaceae*
    5. Fertile fronds (or their fertile portions) conspicuously unlike the sterile; sporangia naked.
      6. Sporangia 2-ranked, in spikes or panicles apparently at the summit of the stem, the leaf-like sterile portion lateral or basal; rhizome scarcely developed........5. *Ophioglossaceae*
      6. Sporangia not 2-ranked, borne on much modified divisions at the summit or middle of the sterile frond; rhizomes stout..........................6. *Osmundaceae*

## SPERMATOPHYTA

*Plants with true flowers containing stamens or pistils or both, reproducing by seeds (each containing an embryo).*

1. Ovules borne on an open scale, not enclosed; trees or shrubs with needle-like or scale-like, mostly evergreen leaves..........................A. *GYMNOSPERMAE*
1. Ovules borne in a closed ovary which, at maturity, becomes the fruit; herbs or woody plants, with broad or narrow, evergreen or deciduous leaves....................B. *ANGIOSPERMAE*

### A. *GYMNOSPERMAE*

1. Fruit red and berry-like; leaves spreading into two ranks, green on both sides........8. *Taxaceae*
1. Fruit a cone, or bluish and berry-like; leaves not 2-ranked, but appearing so in *Abies* (with leaves whitened beneath)..........................9. *Pinaceae*

### B. *ANGIOSPERMAE*

1. Parts of the flower usually in 3's or 6's, never in 5's; embryo with a single cotyledon; leaves chiefly parallel-veined..........................I. *MONOCOTYLEDONEAE*
1. Parts of the flower mostly in 4's or 5's; embryo with a pair of opposite cotyledons; leaves netted-veined..........................II. *DICOTYLEDONEAE*

## I. *MONOCOTYLEDONEAE*

1. Plants floating or submersed, not rooting, distinct or forming tangled mats; true leaves wanting, the single frond of each plant bearing the flowers (rare) and suspended roots......20. *Lemnaceae*

1. Plants with true leaves (these sometimes reduced to scales), rooting in the substratum.

2. Plants immersed aquatics, rooting in the mud, the upper leaves often floating on the surface.

3. Flowers solitary in the axils of sheathing leaves or from spathes, monoecious or dioecious.

4. Pistillate flowers lacking a perianth; staminate flower (a single terminal stamen) enclosed in a sac-like perianth..........................................................13. *Najadaceae*

4. Pistillate and staminate flowers both with a perianth consisting of 3 small sepals and 3 small petals; stamens mostly 2 or 9..................................16. *Hydrocharitaceae*

3. Flowers clustered or in spikes or heads.

5. Flowers in globose heads, monoecious, the upper heads staminate, the lower ones pistillate; leaves alternate..................................................11. *Sparganiaceae*

5. Flowers clustered or in spikes, monoecious or perfect; leaves opposite or alternate.......... ...................................................................12. *Zosteraceae*

2. Plants of dry to marshy terrestrial habitats (if growing in water, the stems aerial).

6. Perianth wanting, or consisting merely of bristles or scales.

7. Flowers enclosed or subtended by chaff-like scales (glumes); plants grass-like, with jointed stems, sheathing leaves, and 1-seeded fruit.

8. Stems commonly hollow or with soft pith, round or flattened; leaf-sheaths usually open; anthers attached at the middle....................................17. *Gramineae*

8. Stems usually solid and 3-angled; leaf-sheaths closed; anthers attached at the base...... ...................................................................18. *Cyperaceae*

7. Flowers not enclosed in glumes.

9. Flowers monoecious, not on a fleshy axis; leaves elongate, linear, sessile.

10. Flowers densely crowded in a terminal spike staminate at summit, pistillate below; perianth of hair-like bristles..........................................10. *Typhaceae*

10. Flowers in globose heads, the upper ones staminate, the lower pistillate; perianth of flat scales...................................................11. *Sparganiaceae*

9. Flowers monoecious or the lower ones perfect, crowded upon a fleshy axis (spadix) subtended by a spathe; leaves broad, petioled.............................19. *Araceae*

6. Perianth (at least the calyx) present.

11. Flowers crowded upon a spadix subtended or enclosed by a spathe; perianth of 4 or 6 concave sepals........................................................19. *Araceae*

11. Flowers not on a spadix.

12. Perianth free from the ovary (ovary superior).

13. Carpels 3-many, distinct or separating at maturity.

14. Leaves grass-like or rush-like; perianth a single series of 6 greenish divisions; carpels 3, nearly distinct, or 3-6, united until maturity.......14. *Juncaginaceae*

14. Leaves broader, not grass-like; perianth of 3 greenish sepals and 3 white petals; carpels numerous, distinct....................................15. *Alismataceae*

13. Carpels 3, united into a compound ovary.

15. Divisions of the perianth alike or nearly so.

16. Perianth glumaceous, scarious to firm, green to brown or purplish; plant a rush, with slender leaves or these reduced to sheaths; stamens 3 or 6...... .......................................................22. *Juncaceae*

16. Perianth herbaceous or petaloid; leaves often broader; stamens 6 (exceptionally 4).............................................23. *Liliaceae*

15. Divisions of the perianth unlike, the sepals green, the petals white or variously coloured.

17. Leaves narrow, alternate, parallel-veined, strongly sheathing the stem, the uppermost spathe-like; flowers several..............21. *Commelinaceae*

17. Leaves ovate, netted-veined, in a whorl of 3 below the solitary terminal flower; (*Trillium*)..........................................23. *Liliaceae*

12. Perianth adnate to the ovary (ovary wholly or partly inferior).

18. Flowers regular or nearly so; fertile stamens 3 or 6.

19. Stamens 6; flowers yellow..............................24. *Amaryllidaceae*

19. Stamens 3; flowers pale blue to blue-violet....................25. *Iridaceae*

18. Flowers very irregular; fertile stamen 1 (in *Cypripedium* 2).....26. *Orchidaceae*

## II. *DICOTYLEDONEAE*

1. Corolla none; calyx present or absent.

2. Flowers unisexual, either staminate or pistillate.

3. Plants parasitic on branches of trees; stem and branches jointed; leaves reduced to minute scales; fruit a leathery berry........35. *Loranthaceae*

3. Plants rooting in the ground, not parasitic on branches of trees.

4. Trees or shrubs.

5. Leaves pinnately compound.

6. Leaflets mostly 3–5, entire or coarsely few-toothed or lobed; fruit 2 separable inequilateral samaras........67. *Aceraceae*

6. Leaflets 5–11, more regularly and finely toothed, not lobed; fruit a single equilateral samara........90. *Oleaceae*

5. Leaves simple.

7. Leaves linear, evergreen, soon reflexed, 2·5–7 mm. long; sepals 3, petaloid; fruit a 6-9-seeded black berry-like drupe........64. *Empetraceae*

7. Leaves dilated, longer, spreading or ascending; fruit a dry capsule, nut, or usually winged nutlet (berry-like only in *Shepherdia*).

8. Fruit berry-like; leaves opposite, scurfy with rusty scales beneath or silvery on both sides; (*Shepherdia*)........78. *Elaeagnaceae*

8. Fruit not berry-like; leaves alternate.

9. Fruit a many-seeded capsule, the seeds furnished with long silky down; plants dioecious, with both kinds of flowers in catkins (aments)........27. *Salicaceae*

9. Fruit a nut or nutlet.

10. Fruit an acorn (nut subtended by a scaly cup-shaped or saucer-shaped involucre); leaves deeply lobed........30. *Fagaceae*

10. Fruit not an acorn.

11. Leaves sessile or nearly so, resinous-dotted; staminate and pistillate flowers both in aments, the pistillate ones solitary under each entire bract; nuts drupe-like........28. *Myricaceae*

11. Leaves distinctly petioled; staminate and pistillate flowers both in aments, or (in *Corylus*) the pistillate ones capitate; nuts not drupe-like ........29. *Betulaceae*

4. Herbs.

12. Plant simmersed aquatics, rooting int he mud, the upper leaves sometimes floating on the surface.

13. Leaves whorled, finely dissected into capillary to linear serrate divisions; fruit ellipsoid, 4·5–5·5 mm. long; style 1........43. *Ceratophyllaceae*

13. Leaves opposite, linear to obovate, entire; fruit globose to ovoid, 4-lobed, not more than 2·5 mm. long; styles 2........63. *Callitrichaceae*

12. Plants terrestrial.

14. Leaves 2-3-ternately compound, the leaflets stalked; sepals petaloid or herbaceous; inflorescence a panicle; (*Thalictrum*)........45. *Ranunculaceae*

14. Leaves simple.

15. Nodes of stem and panicled racemes covered by tubular sheaths (ocreae); leaves acid, at least the basal ones hastate or sagittate; fruit a 3-angled achene; (*Rumex*)........37. *Polygonaceae*

15. Nodes without tubular sheaths.

16. Leaves cordate mostly 3-5(-7)-lobed or those of the branches sometimes uncleft; plant twining, harshly scabrous........32. *Cannabinaceae*

16. Leaves not obviously lobed; plants not twining.

17. Calyx wanting, the flowers borne from the base of a calyx-like involucre (cyathium) with coloured glands near summit, the glands sometimes with petaloid appendages........62. *Euphorbiaceae*

17. Calyx present, at least in staminate flowers.

18. Leaves opposite, petioled; stinging bristles present; (*Urtica*)........ ........33. *Urticaceae*

18. Leaves alternate.

19. Stinging bristles present; staminate and pistillate flowers clustered in loose cymes; leaves ovate, acuminate, coarsely tipped; (*Laportea*)........33. *Urticaceae*

19. Stinging bristles absent; staminate (or all flowers) in spikes or heads.

20. Spikes or heads of flowers close or continuous.

21. Staminate and pistillate (and perfect) flowers intermixed in axillary involucrate-bracted cymose clusters; leaves thin; (*Parietaria*)..........................33. *Urticaceae*

21. Staminate flowers in slender spikes terminating otherwise pistillate flowering branches of the paniculate inflorescence; pistillate flowers solitary in the axils; leaves firm; (*Axyris*)....................................38. *Chenopodiaceae*

20. Spikes or heads of flowers interrupted.

22. Flowers bracted at base, the bracts and sepals scarious.........................................39. *Amaranthaceae*

22. Flowers bractless; sepals herbaceous or fleshy..................................................38. *Chenopodiaceae*

2. Flowers (or at least some in each inflorescence) with both stamens and pistil.

23. Trees, shrubs or climbers.

24. Plants climbing by the bending stalks of the compound leaves; styles long and plumose; (*Clematis*)..................................................45. *Ranunculaceae*

24. Plants not climbing; leaves simple.

25. Leaves silvery-scurfy on both sides; flowers pale yellow inside, silvery outside; fruit silvery, 8-10 mm. long; (*Elaeagnus*)..............................78. *Elaeagnaceae*

25. Leaves not scurfy.

26. Leaves opposite, palmately veined; styles 2; fruit 2 separable 1-seeded samaras or "keys"..................................................67. *Aceraceae*

26. Leaves alternate, pinnately veined.

27. Low shrub; fruit a black 3-seeded drupe; style 1; leaves symmetrical at base; (*Rhamnus*)..................................................69. *Rhamnaceae*

27. Trees; fruit a 1-seeded drupe or a 1-seeded elliptic samara; leaves oblique at base, one margin longer than the other........................31. *Ulmaceae*

23. Herbs.

28. Plants aquatic, the submersed whorled leaves pinnately dissected into capillary divisions; flowers sessile in the axils of entire or pinnate bracts near summit of stem; stamens 8..........................................................81. *Haloragaceae*

28. Plants terrestrial.

29. Leaves (at least the lower) deeply lobed or divided (if unlobed, the sepals petal-like).

30. Stamens 2; sepals not petal-like; pistil 1; (*Lepidium*)..............50. *Cruciferae*

30. Stamens numerous; sepals often petal-like; pistils few to many..........................................................45. *Ranunculaceae*

29. Leaves neither deeply lobed nor divided; sepals not petal-like.

31. Calyx free from the ovary (ovary superior).

32. Stem very succulent, the flowers deeply immersed in the hollows of its joints; leaves reduced to appressed opposite scale; (*Salicornia*)....38. *Chenopodiaceae*

32. Stems only slightly, if at all, succulent; leaves normal.

33. Leaves mostly alternate.

34. Nodes of stem and inflorescence mostly covered by tubular sheaths (ocreae)..........................................37. *Polygonaceae*

34. Nodes not covered by tubular sheaths............38. *Chenopodiaceae*

33. Leaves opposite.

35. Leaves linear to narrowly oblong, fleshy, the flowers solitary in their axils; plant of wet saline habitats; (*Glaux*)........89. *Primulaceae*

35. Leaves linear-lanceolate to broadly ovate, not fleshy; inflorescence a terminal panicle, each flower-cluster subtended by a broad open corolla-like involucre; plants of dry prairie habitats............................................40. *Nyctaginaceae*

31. Calyx adnate to the ovary (ovary inferior).

36. Leaves in whorls of 3-12, with flowers in middle and upper axils; aquatics..................................................82. *Hippuridaceae*

36. Leaves not whorled.

37. Plants stemless, with a single pair of broadly reniform leaves; calyx large, 3-lobed, purple-brown.........................36. *Aristolochiaceae*

37. Plants leafy-stemmed; calyx small, 4-5 lobed.

38. Leaves linear to ovate, alternate; stamens 5; style 1; fruit a dry nut or berry-like; root-parasitic terrestrial plants..........34. *Santalaceae*

38. Leaves roundish or round-reniform, opposite or alternate; stamens 4-10; styles 2; fruit a many-seeded capsule; plants sub-aquatic, with prostrate stems; (*Chrysosplenium*)..............................55. *Saxifragaceae*

1. Corolla and calyx both present.

39. Stems spiny, thickened and very fleshy, globular or flattened and jointed, without green leaves; flowers large and showy, yellow or purple; plants chiefly of dry sandy prairie habitats ..................................................................77. *Cactaceae*

39. Stems otherwise; leaves mostly normal and green.

40. Corolla of separate petals (in *Amorpha*, the petal solitary).

41. Trees, shrubs or climbers.

42. Plants climbing.

43. Leaves opposite, compound, their stalks twisting around supports; styles long and plumose; (*Clematis*)....................................45. *Ranunculaceae*

43. Leaves alternate; styles not plumose.

44. Plants climbing by tendrils; leaves simple or digitately compound.........
..................................................................70. *Vitaceae*

44. Plants climbing by twining of the stem; leaves simple.

45. Leaves round-cordate, broadly 3-7-lobed, peltate near the edge of the basal sinus; petals 6-8; fruit a black 1-seeded drupe....47. *Menispermaceae*

45. Leaves ovate-oblong, finely serrate; petals 5; fruit an orange or orange-yellow 3-6-seeded capsule..............................66. *Celastraceae*

42. Plants not climbing.

46. Leaves compound, alternate.

47. Petal (the standard) solitary; stamens 10, united at the very base; fruit a legume; (*Amorpha*).......................................57. *Leguminosae*

47. Petals 5; stamens distinct to base; fruit not a legume.

48. Stamens numerous; flowers perfect.........................56. *Rosaceae*

48. Stamens 5; flowers dioecious or polygamous...........65. *Anacardiaceae*

46. Leaves simple.

49. Fruit 2 separable 1-seeded samaras or "keys"; styles 2; leaves opposite, palmately veined............................................67. *Aceraceae*

49. Fruit not a samara.

50. Anthers opening by pores or chinks.

51. Stem armed with prickles at the nodes; sepals and petals 6; (*Berberis*)
...................................................46. *Berberidaceae*

51. Stem unarmed; sepals and petals 5.
Anthers erect, opening by apical pores..................87. *Ericaceae*
Anthers inverted, opening by basal (apparently apical) pores........
.....................................................86. *Pyrolaceae*

50. Anthers not opening by pores or chinks.

52. Leaves opposite or clustered toward the ends of the twigs; inflorescence a cyme; fruit a drupe..................................85. *Cornaceae*

52. Leaves alternate.

53. Stamens 5.

54. Fruit dry, 3-lobed, splitting into three 1-seeded carpels; stamens opposite the petals; plants of dry sandy habitats; (*Ceanothus*)..................................69. *Rhamnaceae*

54. Fruit a many-seeded berry; stamens opposite the calyx-segments; (*Ribes*)..........................55. *Saxifragaceae*

53. Stamens numerous.

55. Filaments free; peduncle not united to a tongue-shaped bract
.............................................56. *Rosaceae*

55. Filaments cohering with each other in 5 groups; peduncle united to a tongue-shaped bract aiding in dispersal of the fruit.......
...............................................71. *Tiliaceae*

41. Herbs.

56. Plants aquatic, the leaves submersed or floating on the surface.

57. Leaves mostly submersed, coarsely to finely dissected, covering the stem.

58. Flowers monoecious, sessile in the axils of entire or pinnate bracts near summit of stem, the lower ones pistillate, the upper staminate; stamens 8..
......................................................81. *Haloragaceae*

58. Flowers perfect, pedicelled; stamens usually more numerous; (*Ranunculus*)........................................................45. *Ranunculaceae*

57. Leaves mostly floating, suborbicular to reniform, entire except for the basal sinus; flowers perfect; petioles and peduncles arising from rhizomes.............................................................44. *Nymphaeaceae*

56. Plants terrestrial, of dry to swampy or muddy habitats.

59. Anthers opening by apical pores or lids.

60. Leaves ternately compound, not evergreen; sepals, petals, and stamens 6; anthers opening by 2 valves or lids hinged at the top; (*Caulophyllum*)...........................................................46. *Berberidaceae*

60. Leaves simple and evergreen (sometimes reduced to scales); sepals and petals mostly 5; stamens mostly 10; anthers inverted, opening by basal (apparently apical) pores..............................................86. *Pyrolaceae*

59. Anthers not opening by pores or lids.

61. Ovary inferior, adnate to or enclosed by the calyx-tube.

62. Leaves simple.

63. Flowers in a dense head-like cyme subtended by 4 broad white or purple-tipped petaloid bracts...........................85. *Cornaceae*

63. Flowers neither cymose nor subtended by a petaloid involucre.

64. Ovary and capsule surrounded by calyx-tube but free from it; flowers purple; leaves opposite or whorled in 3's.......79. *Lythraceae*

64. Ovary and capsule fused to calyx-tube.

65. Leaves alternate, coarsely and sharply dentate, very adhesive by the barbed pubescence; petals 10, white or pale yellow, up to 6 cm. long; stamens abundant................76. *Loasaceae*

65. Leaves alternate or opposite, not adhesive; petals 2 or 4, smaller; stamens mostly 8.....................80. *Onagraceae*

62. Leaves compound, mostly alternate.

66. Inflorescence a spike-like raceme of yellow flowers; throat of calyx-tube beset with hooked bristles; stamens 5-15, inserted on the calyx; (*Agrimonia*)............................................56. *Rosaceae*

66. Inflorescence a simple or compound umbel; stamens 5, inserted on a disk crowning the ovary at base of the styles.

67. Fruit 2 seed-like dry 1-seeded carpels cohering by their inner face, separating when ripe; styles 2.....................84. *Umbelliferae*

67. Fruit a 5-seeded blackish drupe; styles usually more than 2...............................................83. *Araliaceae*

61. Ovary superior, not enclosed by or covered by the calyx-tube.

68. Plants insectivorous, of boggy habitats; leaves all basal.

69. Leaves hollow, pitcher-shaped, usually partly filled with water, tipped by an erect reniform hood covered with reflexed bristles; flower large, solitary, deep purple.................52. *Sarraceniaceae*

69. Leaves linear to suborbicular, covered with gland-tipped hairs; flowers small, in a 1-sided simple raceme-like inflorescence.........................................................53. *Droseraceae*

68. Plants not insectivorous, mostly of drier habitats.

70. Flowers irregular.

71. Stamens 5 or 6.

72. Stamens 5; leaves simple (deeply cleft in one species of *Viola*).

73. Petals 5, the lower one spurred at base; sepals 5, auricled; flowers white, yellow, or purplish............75. *Violaceae*

73. Petals 2, 2-lobed; sepals 4, one of them spurred at base; flowers pale yellow to orange, usually dotted with brown or crimson..............................68. *Balsaminaceae*

72. Stamens 6, in 2 sets of 3 each; petals 4, in 2 pairs, one of them saccate at base; sepals scale-like; leaves compound.........................................48. *Papaveraceae*

71. Stamens 15-20; sepals and petals 6; flowers pale yellow; leaves irregularly pinnate or bipinnatifid..................51. *Resedaceae*

70. Flowers regular or nearly so.

74. Stamens borne on the receptacle.

75. Sepals or calyx-lobes 2.

76. Sap watery; petals 5; stamens 5-12; seeds borne on stalks from the base of the capsule..............41. *Portulacaceae*

76. Sap milky or orange-red; petals 4 or 6-12; stamens many; seeds borne on the wall of the capsule.....48. *Papaveraceae*

75. Sepals or calyx-lobes 4-7.

77. Stamens 6, tetradynamous (4 long and 2 short); sepals and petals 4....................................50. *Cruciferae*

77. Stamens 4-many (if 6, not tetradynamous).

78. Sepals and petals 4; stamens 6 or about 11; leaves compound, with 3 leaflets................49. *Capparidaceae*

78. Sepals and petals mostly 5.

79. Pistil solitary; fruit a capsule; stamens 4-10; leaves simple, mostly entire and opposite...................................................42. *Caryophyllaceae*

79. Pistils few to many, distinct; fruit either capsules, achenes, or berries; stamens often more than 10; leaves simple or compound, entire or toothed or lobed, mostly alternate or basal...45. *Ranunculaceae*

74. Stamens adnate to base of perianth or inserted on a disk or thickened zone beneath the ovary.

80. Leaves compound.

81. Carpels 2-many, distinct, forming achenes or drupelets; stamens usually numerous....................56. *Rosaceae*

81. Carpels united into a compound ovary; fruit a capsule; stamens 5 or 10.

82. Leaflets 3, obcordate, acid to taste; filaments united into a tube; mature carpels many-seeded.....................................................59. *Oxalidaceae*

82. Leaflets 3-several, the divisions pinnatifid; filaments distinct; carpels 1-seeded..............60. *Geraniaceae*

80. Leaves simple, entire to deeply cleft.

83. Stamens numerous, united into a central column around the pistil; leaves alternate, shallowly lobed to deeply cleft..........................................72. *Malvaceae*

83. Stamens 4-many, distinct or united only at base.

84. Leaves mostly opposite.

85. Leaves entire, sessile or nearly so, dotted; stamens 9-many, often in 3-5 clusters...........73. *Guttiferae*

85. Leaves toothed to deeply cleft; stamens 5-10, not in clusters.

86. Carpels 4-5, distinct, many-seeded; petals creamy or greenish-yellow; leaves succulent, coarsely toothed........................54. *Crassulaceae*

86. Carpels 1-seeded, united into a compound ovary; petals white to roseate or purple; leaves deeply cleft............................60. *Geraniaceae*

84. Leaves mostly alternate or basal (scale-like and strongly overlapping in the heath-like genus *Hudsonia*).

87. Stamens 5 or 10.

88. Stamens 5, their filaments united at base; leaves linear to linear-lanceolate, entire.....58. *Linaceae*

88. Stamens 10, distinct (if 5, the leaves broader and chiefly basal)..................55. *Saxifragaceae*

87. Stamens indefinite.

89. Carpels several, distinct, forming plumose-styled achenes or yellowish drupelets; leaves lanceolate to round-reniform; (*Dryas; Rubus*)...................................56. *Rosaceae*

89. Carpels united into a compound ovary; fruit a capsule; leaves linear and scale-like to oblong-lanceolate..........................74. *Cistaceae*

40. Corolla with petals more or less united.

90. Stamens more numerous than the lobes of the corolla.

91. Leaves simple, entire to deeply lobed.

92. Flowers very irregular; petals 3, connected with the stamen-tube; leaves entire or finely toothed........61. *Polygalaceae*

92. Flowers regular or nearly so.

93. Stamens numerous, united into a central column around the pistil; leaves shallowly lobed to deeply cleft........72. *Malvaceae*

93. Stamens 8 or 10, distinct; leaves entire or finely toothed.......87. *Ericaceae*

91. Leaves, at least the lower ones, compound.

94. Flowers regular.

95. Leaflets 3, obcordate, acid to taste; filaments united into a tube........59. *Oxalidaceae*

95. Leaflets mostly 5 or more, not obcordate.

96. Stamens numerous, united into a central column around the pistil; flowers large, coppery-scarlet or brick-red; leaves palmately divided; (*Sphaeralcea*)........72. *Malvaceae*

96. Stamens 8-12, distinct or partly united in pairs; flowers small, greenish or yellowish, capitate; radical leaves 1-3-ternate, those of the stem 3-cleft or 3-parted........108. *Adoxaceae*

94. Flowers very irregular.

97. Sepals 2; petals in 2 pairs; stamens 2 sets of 3 each, their filaments often united; leaves exstipulate, the leaflets finely dissected......48. *Papaveraceae*

97. Sepals united, the calyx-tube 4-5-toothed; petals usually 5, the corolla more or less distinctly papilionaceous; stamens 10, 9 or all of them united into a tube (or all distinct in *Thermopsis*); leaves stipulate, the leaflets entire or toothed........57. *Leguminosae*

90. Stamens not more numerous than the lobes of the corolla.

98. Shrubs, climbers, or trailing or tufted evergreen plants; stamens alternate with corolla-lobes or fewer in number.

99. Plants climbing, or evergreen and trailing or tufted.

100. Plants climbing; leaves alternate.

101. Plants climbing by twisting of the stem around supports; flowers perfect; ovary superior, free from the calyx-tube, forming a 2-6-seeded capsule; leaves broad and green or (in *Cuscuta*) reduced to a few minute scales........94. *Convolvulaceae*

101. Plants climbing by tendrils; flowers monoecious or dioecious; ovary inferior, adnate to the calyx-tube, forming a fleshy fruit (pepo); leaves normal........111. *Cucurbitaceae*

100. Plants trailing or tufted, evergreen; leaves opposite.

102. Leaves rounded-oval, sparingly crenate; peduncles 2-flowered; ovary inferior, adnate to the calyx-tube; plant trailing; (*Linnaea*)........107. *Caprifoliaceae*

102. Leaves crowded, narrowly spatulate, cartilaginous, entire; peduncles 1-flowered; ovary superior, free from the calyx-tube; dwarf tufted plant of the far-northern regions........88. *Diapensiaceae*

99. Shrubs.

103. Ovary superior, free from the calyx-tube; anthers upright, opening by terminal pores........87. *Ericaceae*

103. Ovary inferior, adnate to the calyx-tube; anthers not opening by terminal pores........107. *Caprifoliaceae*

98. Herbs.

104. Stamens of same number as corolla-lobes and opposite them. .89. *Primulaceae*

104. Stamens alternate with corolla-lobes or fewer.

105. Ovary inferior, adherent to the calyx-tube.

106. Flowers crowded in a dense head on a common receptacle, surrounded by an involucre; fruit a dry seed-like achene.

107. Anthers separate; limb of calyx mostly 8-awned; corollas lilac; leaves deeply pinnatifid or bipinnatifid.........110. *Dipsacaceae*

107. Anthers united into a tube; limb of calyx (pappus) crowning summit of ovary in the form of bristles, awns, scales, or teeth, or sometimes wanting........113. *Compositae*

106. Flowers not in dense heads.
108. Leaves alternate; stamens 5, their anthers free or united into a tube........................................112. *Campanulaceae*
108. Leaves opposite or whorled; anthers free.
109. Stamens 3, always fewer than corolla-lobes; calyx-limb becoming pappus-like; leaves opposite.....109. *Valerianaceae*
109. Stamens 4-5; calyx-limb (when present) not pappus-like; leaves opposite or whorled...................106. *Rubiaceae*
105. Ovary superior, free from the corolla-tube.
110. Corolla irregular.
111. Plants root-parasitic, without chlorophyll or true leaves; stamens 4.............................................102. *Orobanchaceae*
111. Plants not parasitic; leaves normal.
112. Fertile stamens 5; corolla funnelform, oblique, dull yellowish with purple veins; fruit a capsule, the top falling off like a lid; plant clammy-pubescent; (*Hyoscyamus*)......100. *Solanaceae*
112. Fertile stamens 2 or 4.
113. Fruit dry, 1-seeded, strictly reflexed; flowers roseate to purplish, oppositely paired in slender terminal spikes.........................................104. *Phrymaceae*
113. Fruit mostly 4-many-seeded, not strictly reflexed.
114. Ovary 4-lobed or 4-parted, each lobe forming a seed-like nutlet or achene at base of style; stamens a single pair or 2 pairs of unequal length; leaves opposite; stem square.................99. *Labiatae*
114. Ovary unlobed, forming a usually several-many-seeded capsule tipped by the style.
115. Plants insectivorous, aquatic (with bladder-traps borne on branches or finely dissected submersed leaves) or terrestrial (with rosettes of entire broad leaves); stamens 2; capsule 1-locular...................103. *Lentibulariaceae*
115. Plants not insectivorous; stamens 2 or 2 pairs of unequal length; capsule 2-locular.....................................101. *Scrophulariaceae*
110. Corolla regular or nearly so.
116. Stamens fewer than the corolla-lobes.
117. Anthers 4, in pairs; fruit separating into 4 nutlets; leaves opposite..................................98. *Verbenaceae*
117. Anthers 2.
118. Fruit a 2-locular capsule, the top falling off like a lid; leaves in a basal rosette.............105. *Plantaginaceae*
118. Fruit consisting of 4 seed-like nutlets or achenes at base of style; leaves opposite on the square stem.99. *Labiatae*
116. Stamens as many as the corolla-lobes.
119. Stems square.................................99. *Labiatae*
119. Stems roundish.
120. Ovary deeply 4-lobed (unlobed only in *Heliotropium*, but fruit of this 4-lobed), forming 4 seed-like nutlets around base of style; leaves alternate...97. *Boraginaceae*
120. Ovary unlobed.
121. Fruit a many-seeded follicle (dry carpel splitting down one side), the seeds with a coma; plants with acrid milky juice.......................122
121. Fruit a capsule or berry, the seeds without a coma; plants without milky juice....................123
122. Filaments united into a tube, the anthers permanently connected with the stigma; flowers with a 5-parted crown between the corolla and the stamen-tube, the hoods of the crown with or without an incurved horn arising from the cavity..........................93. *Asclepiadaceae*
122. Filaments broad and flat, distinct; crown wanting............................92. *Apocynaceae*

II. DICOTYLEDONEAE—*Concluded*

123. Fruit a berry; anthers separate or forming a tube around the style............100. *Solanaceae*

123. Fruit a capsule; anthers distinct.

124. Ovary and capsule 1-locular.

125. Leaves simple, entire, opposite or whorled (or 3-foliolate and alternate in *Menyanthes*); style short or none (style slender and persistent in *Menyanthes*).......91. *Gentianaceae*

125. Leaves pinnately compound or deeply cleft and lobed, opposite or alternate; style 2-cleft..........................................................96. *Hydrophyllaceae*

124. Ovary and capsule 2-3-locular; leaves simple.

126. Leaves alternate, petioled, at least the upper ones narrowly to broadly oblong or oval, cordate or subtruncate to tapering at base; flowers funnelform, 3·5-7 cm. long, solitary in the axils; style undivided or merely 2-cleft at apex...............94. *Convolvulaceae*

126. Leaves alternate or opposite, sessile, linear to oblong-lanceolate, rounded to tapering at base; flowers smaller, cymose or clustered (if solitary at the ends of the branches, the leaves awl-shaped, 4-10 mm. long, strongly overlapping); style 3-lobed.................................................................95. *Polemoniaceae*

## Division I. **PTERIDOPHYTA** (Ferns and Fern Allies)

### 1. EQUISETACEAE

### (Horsetail Family)

### 1. Equisetum L.

### (Horsetail. Scouring Rush)

1. Cones rounded at summit, long-peduncled; stems relatively soft and pliant, at least the sterile ones usually with whorls of branches.

2. Sheaths green below, chestnut-brown above, their teeth cohering in broad lobes; branches mostly themselves branching.........................3. *E. sylvaticum*

2. Sheaths uniformly green, their teeth free or united only at base; branches normally simple.

3. Stems soft and papery, strongly flattened under pressure, the central cavity at least four-fifths the total diameter..............................4. *E. fluviatile*

3. Stems firmer, the central cavity smaller.

4. First internode of the primary branches much shorter than the adjacent stem-sheath; branches mostly 5-6-angled...........................5. *E. palustre*

4. First internode of the primary branches about half as long to greatly exceeding the adjacent stem-sheath; branches 3-4-angled.

5. Fertile stem simple, flesh-colour, soon withering; branches of sterile stems with sheaths bearing dark lance-attenuate teeth.....................1. *E. arvense*

5. Fertile stem developing whorls of slender green branches, the sheaths of these with pale deltoid teeth.........................................2. *E. pratense*

1. Cones tipped with a short rigid point, subsessile or short-peduncled from the uppermost sheath; stems stiff and mostly evergreen, the sterile and fertile ones similar and without regularly whorled branches.

6. Stems solid at centre, slender, tufted, low and flexuous; cones 2-5 mm. long..........................................................6. *E. scirpoides*

6. Stems with a central cavity, stouter and taller; cones longer.

7. Stems normally 5-10-ridged, tufted, their sheaths with whitish persistent teeth; cones 5-10 mm. long.......................................7. *E. variegatum*

7. Stems normally 14-40-ridged, solitary, the teeth of their sheaths deciduous; cones 1-2 cm. long at maturity.

8. Sheaths longer than broad, slightly flaring toward the black-banded apex; stems smoothish, mostly annual....................................8. *E. laevigatum*

8. Sheaths cylindric, not much longer than broad, black-banded at base and apex; stems rough, evergreen............................9. *E. hyemale* var. *affine*

1. **E. arvense** L. Field-Horsetail

Damp woods and dry or moist open habitats throughout the province. Northernmost collection: Nueltin Lake (Baldwin, 1951). Earliest collection seen: near Emerson (Burgess, 1873). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg [Dawson, 1875].

Arctic circumpolar: n. coast of Alaska, Can. Arct. Arch. (to northernmost Ellesmereland), to n. Lab., s. throughout most of the U.S.; Greenland; Iceland; Spitsbergen; Eurasia; northern Africa. A map of the northern part of the American area is given by Raup [1947, pl. XIII].

Forma *boreale* (Bong.) Klinge, with 3-angled rather than 4-angled branches, is the common form in the northern parts of the province. Its reduction from varietal status follows the finding that both types of branches (as distinct from branchlets) may occur on the same plant.

Forma *campestre* (C. F. Schultz) Klinge, with small cones at the ends of green branches of the normally sterile stem, has been collected along the Hudson Bay Railway at Mile 256 (Eaton, 1917) and Gillam (Schofield, 1950). This is probably the plant listed by Bell [1884], under the name "var. *scrotinum*, E. Meyer", as being collected along the shore of Hudson Bay at York Factory and Fort Churchill, although supporting specimens have not been located.

Forma *diffusum* (A. A. Eat.) Clute, with forking branches and prostrate sterile stem, has been collected by the writer at Portage la Prairie, Pipestone Lake, Knee Lake, and Hayes River at the entrance of Fox River. It is probably of common occurrence throughout the province.

Forma *ramulosum* (Rupr.) Klinge, with forking branches, the short internodes of the ascending stem more or less hidden by the ascending branches, has been found at several southern localities.

Forma *pseudo-silvaticum* (Milde) Luerss., with forking but more divergent branches from longer internodes, was collected by the writer on Porcupine Mountain.

2. **E. pratense** Ehrh. Meadow-Horsetail

Open woods and thickets throughout the southern half of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Shoal Lake, Ontario boundary of southern Manitoba (Lowe, 1920). First report: York Factory [Bell, 1881].

Subarctic circumpolar: central Alaska and Yukon to James Bay and Nfld., s. to N.J., Mont., and s. B.C.; Iceland; Eurasia.

3. **E. sylvaticum** L. Wood-Horsetail

Woodlands and thickets throughout southern and central Manitoba, and barren grounds of the north. Northernmost collection: Baralzon Lake, lat. 60° 00′ N. (Scoggan & Baldwin, 1950). Earliest collection seen: Warren Landing (Lowe, Aug. 1918). First report: Churchill River [Bell, 1880]. The Manitoba plant appears to be chiefly or entirely the smoothish branched var. *pauciramosum* Milde forma *multiramosum* Fern. (var. *multiramosum* (Fern.) Wherry, Am. Fern Jour. 27: 58. 1937).

(Arctic-)subarctic circumpolar: central Alaska and Yukon to Great Bear L., s. Keewatin, and n. Lab., s. to s. B.C., Ia., and Md.; sw. Greenland; Iceland; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIII].

4. **E. fluviatile** L. (*E. limosum* L. var. *verticillatum* Döll) Water-Horsetail. [*See* Fernald & Weatherby, Rhodora 23: 43-47. 1921].

Shallow water and wet shores throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 43′ N. (Baldwin, 1951). Earliest collection seen: Sewell (now Camp Hughes, near Carberry) (Macoun, 1896). First report: near Winnipeg [Hooker, 1840].

Subarctic circumpolar: central Alaska and Great Bear L. to s. Keewatin, n. Que., s. Lab., and Nfld., s. to Oreg. and Va.; Iceland; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIII], to which should be added dots indicating a general distribution throughout Manitoba.

Forma *linnaeanum* (Döll) Broun (*E. limosum* L.), differing from the typical form in its stem being naked or furnished with only a few scattered branches, is of common occurrence throughout the range.

Forma *polystachyum* (Brückn.) Broun, with cones terminating several ascending branches rather than solitary at the tip of the main axis, is reported (as var. *candelabrum* Hook.) by Hooker [1840] from Lake Winnipeg.

5. **E. palustre** L. Marsh-Horsetail [*See* Fernald, Rhod. 49: 278-286. 1947.]

Wet or marshy habitats of the southern and central areas, but less abundant than the preceding four species. Northernmost collection: York Factory (Bell, 1884; Scoggan, 1949). Earliest collection seen: Knee Lake, approx. lat. 55° N. (Bell, 1880). First report: Knee Lake and York Factory [Macoun, 1890].

Subarctic circumpolar: n. Alaska to Great Bear L., n. Man. (York Factory), n. Que., and s. Lab., s. to Calif., Mont., Ill., and N.J.; gap in Greenland; Iceland; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIII].

Forma *polystachion* (Weigel) Duval-Jouve, with many of its branches terminated by cones, is represented by a specimen in the herbarium of the National Museum of Canada collected by J. M. Macoun in 1884 on the shore of Muskeg Island, Lake Winnipeg.

Forma *simplex* Milde, with stem simple or bearing only a few scattered branches, was collected by the writer in 1949 at York Factory, and also on a gravel beach of Hayes River at The Rock, about 110 miles above York Factory.

6. **E. scirpoides** Michx. Dwarf Scouring-rush

Woods, thickets, and less commonly in more open habitats throughout the province. Northernmost collection: Churchill, open forest and muskegs (Porsild, 1930). Earliest collection seen: Bowsman, north of Duck Mountain (Jackson, 1922). First report: "Oxford House to Knee Lake" [Bell, 1881].

Arctic circumpolar: Alaska to Banks I., s. Baffin I., and n. Lab., s. to Wash., S.D., and N.Y.; sw. Greenland; Spitsbergen; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIII].

7. **E. variegatum** Schleich. Variegated Horsetail

Damp or wet habitats throughout the province, but scarcely abundant. Northernmost collection: Churchill (J. M. Macoun, 1910; Porsild, 1930). Earliest collection seen: Churchill (J. M. Macoun, 1910). First report: Red Deer River, lat. 53° N. [Macoun, 1890].

Arctic circumpolar: n. coast of Alaska and Mack. to Prince Patrick I. and northernmost Ellesmereland, s. to Calif., Colo., Ill., and N.J.; w. and e. Greenland; Iceland; Spitsbergen; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIV].

8. **E. laevigatum** A. Br. (*E. hyemale* L. var. *intermedium* A. A. Eat.) Smooth Scouring-rush

Sterile sandy prairie, sandhills, shores, and embankments throughout the southern half of the province. Northernmost collection: sandy island in Playgreen Lake near the north end of Lake Winnipeg (Scoggan, 1948). Earliest collection seen: Dufferin, near Carman (Burgess, 1873). First report: Red River [Dawson, 1875].

Temperate American: B.C. to Que., s. to Calif., Tex., and W. Va.

9. **E. hyemale** L. var. **affine** (Engelm.) A. A. Eat. (var. *pseudohiemale* (Farw.) Morton; *E. prealtum* Raf.) Common Scouring-rush

Dry prairie sandhills and sterile clayey or sandy shores, embankments, etc., throughout the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg (Scoggan, 1948). Earliest collection seen: Birtle, 60 miles northwest of Brandon (Macoun and Herriot, 1906). First report: "Wet places throughout most of southern Manitoba." [Lowe, 1943; as *E. affine* Engelm.]. The plant reported by Dawson [1875] from Souris River as *E. hyemale* presumably belongs here.

(Subarctic-)temperate American: n. Alta. to central Man. and Nfld., s. to N.M., Tex., and Ga.; with the species, subarctic circumpolar (var. *californicum* Milde in western N. Am.).

Var. *affine* forma *polystachyum* Prager, with scattered ascending stiff branches bearing small cones, was collected by the writer in 1953 on prairie sandhills at Treesbank, 20 miles southeast of Brandon.

## 2. LYCOPODIACEAE

(Club-moss Family)

### 1. Lycopodium L.

(Club-moss)

1. Sporangia (spore-cases) borne in the axils of ordinary green leaves and not in definite strobiles (spikes).
   2. Leaves essentially entire, broadest at base, appressed-ascending, of nearly uniform length; stems densely tufted and rigidly ascending, with rooting base 1-8 cm. long; northern species .......... 1. *L. selago*
   2. Leaves obviously toothed, broadest above the middle, becoming reflexed, in alternate zones of longer and shorter lengths; stems elongate and creeping, the rooting base 1-4 cm. long; southern species .......... *L. lucidulum*

1. Sporangia borne in terminal scaly-bracted strobiles.
   3. Leaves linear, tipped by a soft hair-like bristle, those of the peduncle much reduced; stems creeping on the ground and much elongated.
      4. Peduncles with 2 or more strobiles; leaves of the ascending branches usually spreading .......... *L. clavatum*
      4. Peduncles with only 1 strobile; leaves usually ascending or appressed.
         5. Peduncles 4·5-15 cm. long; strobile 3·5-11 cm. long .......... 2. *L. clavatum* var. *megastachyon*
         5. Peduncles 0·5-2·5 cm. long; strobile 1·5-4 cm. long .......... 2a. *L. clavatum* var. *monostachyon*
   3. Leaves not tipped by a hair-like bristle.
      6. Leaves scale-like, their free tips much shorter than the decurrent bases; strobiles on slender and remotely bracted peduncles; ascending branches repeatedly forking, tree-like .......... 3. *L. complanatum*
      6. Leaves linear; strobiles sessile, terminating leafy branches.
         7. Stem subterranean, the upright branches repeatedly forking, tree-like .......... 4. *L. obscurum*
         7. Stem trailing near the surface of the ground, its branches only sparingly forked.
            8. Leaves obviously toothed, spreading or reflexed .......... 5. *L. annotinum*
            8. Leaves entire or obsoletely toothed.
               9. Leaves strongly ascending to tightly appressed, thick and hard .......... 5a. *L. annotinum* var. *pungens*
               9. Leaves mostly spreading or reflexed, thinner .......... 5b. *L. annotinum* var. *acrifolium*

1. **L. selago** L. Mountain-Club-moss

Northernmost collection: Baralzon Lake, lat. 60° 00′ N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Churchill, igneous ridge and edge of dried up pool (Gillett, 1948). First report: Churchill [Radforth, 1950]. The following localities complete the known extent of the species in Manitoba: Max Lake of the Hayes River system, 20 miles south of Oxford Lake, schistose cliffs (Scoggan, 1949); Lamprey, 32 miles south of Churchill, higher barren grounds (Dorothy Brown, 1950); Nueltin Lake, lat. 59° 48′ N., bare knoll (Baldwin, 1951). All of the Manitoba material is referable to forma *appressum* (Desv.) Gelert, with appressed or incurved leaves.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack. to Victoria I., n. Baffin I., central Ellesmereland, and n. Lab., s. to Conn., and in the mts. to Oreg., Wisc., and N.C.; circumgreenlandic; Iceland; Spitsbergen; Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XIV], to which should be added dots representing the known occurrence in Manitoba.

*Lycopodium lucidulum* Michx. is reported by Lowe [1943] from Victoria Beach and Riding Mountain. However, in the absence of supporting specimens, and as Fernald [1950] and Gleason [1952] both give Ontario as the western limit (although there are specimens from British Columbia in the herbarium of the National Museum of Canada, it seems best to exclude this species for the present from the flora of Manitoba.

2. **L. clavatum** L. var. **megastachyon** Fern. & Bissell. Running Club-moss

Conifer woods and rock outcrops in the southern half of the province; evidently largely or entirely confined to the area of Precambrian igneous rocks east of Lake Winnipeg, although the typical form is reported from

Flin Flon by Lowe (1943). Northernmost collection: near Herb Lake village on Wekusko Lake, 80 miles northeast of The Pas (Scoggan, 1949). Earliest collection seen: Bloodvein River, east coast of Lake Winnipeg at The Narrows (Macoun, 1884). First report: the present publication; but presumably the plant reported by Bell [1880] from Churchill River, Manitoba, as the typical form.

(Subarctic-)temperate eastern American: central Man. to Nfld., s. to n. Wisc. and Conn.; with the species, subarctic circumpolar.

2a. **L. clavatum** var. **monostachyon** Grev. & Hook.

The two following appear to be the only authentic specimens collected: Cochrane River, lat. 58° 13′ N., willow thicket (Baldwin, 1951); Nueltin Lake, lat. 59° 48′ N., open black spruce woods (Baldwin, 1951). The inclusion of Manitoba in the range given by Fernald [1950] was probably based on the citation of this variety from Bloodvein River by Macoun [1890], although, as noted above, this collection is of the preceding variety. First report: Bloodvein River, Lake Winnipeg [Macoun, 1890].

Subarctic American: central Alaska and Yukon to s. Keewatin, James Bay, and n. Que., s. to s. B.C., Mont., N.H., and Nfld.; sw. Greenland; Iceland. According to Hultén [1941], this entity is identical with var. *lagopus* Laest. of northern Scandinavia and may eventually be accorded recognition as circumpolar in range. A map of the northern part of the distribution is given by Raup [1947, pl. XIV], in which the "Bloodvein River" dot on Lake Winnipeg should be removed, and the Cochrane River and Nueltin Lake stations indicated.

3. **L. complanatum** L. Ground-Cedar

Dry woods (chiefly coniferous) and rocky clearings throughout Manitoba, with the exception of the southern prairie region and the northeastern barren grounds. Northernmost collection: Nueltin Lake, lat. 59° 48′ N. (Baldwin, 1951). Earliest collection seen: Swan Lake House (Macoun, 1881). First report: Swan Lake [Macoun, 1890]. Plants with strobiles solitary on the peduncles may be separated as var. *canadense* Vict., although plants occur in our area combining this character with the plural strobiles of the typical form.

(Arctic-)subarctic circumpolar: central Alaska to Great Bear L., s. Keewatin, and n. Lab., s. to Wash., Ida., Minn., and Pa.; sw. Greenland; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIV], to which may be added dots indicating a general Manitoba distribution except as qualified above.

4. **L. obscurum** L. Ground-Pine

Essentially the same in habitat and distribution as the preceding species. Northernmost collection: Reindeer Lake, lat. 57° 49′ N. (Baldwin, 1951). Earliest collection seen: Shoal Lake, near the Ontario boundary in the south (Lowe, 1920). First report: Lake Winnipeg [Macoun, 1890]. The minor segregate, var. *dendroideum* (Michx.) D. C. Eaton, has recently been reduced to formal status by Boivin [Can. Field-Nat. 65: 20. 1951], and noted by Gleason [1952] as intergrading completely with the typical form.

Subarctic American: interior Alaska and Yukon to Lake Athabasca, s. Lab., and Nfld., s. to Wash., S.D., and N.C.; e. Asia.

5. **L. annotinum** L. Stiff Club-moss

Similar in habitat and distribution to the preceding two species. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: Swan Lake House (Macoun, 1881). First report: Loon Strait, Lake Winnipeg [Macoun, 1890].

(Arctic-)subarctic circumpolar: central Alaska, Mack. R. Delta, and Great Bear L. to n. Man., n. Lab., and Nfld., s. to Oreg., Colo., Minn., and Va.; Eurasia. A map of the northern part of the American distribution of the collective species is given by Raup [1947, pl. XIV].

5a. **L. annotinum** var. **pungens** (LaPylaie) Desv.

Conifer woods of the northern half of Manitoba, and barren grounds of the northeast. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Herchmer, 97 miles south of Churchill (Taverner, 1936). First report: Baralzon and Nejanilini lakes [Scoggan, 1952].

Northern part of the range of the main form.

5b. **L. annotinum** var. **acrifolium** Fern.

Specimens have been seen from the following localities: Herb Lake village on Wekusko Lake, about 80 miles northeast of The Pas, conifer woods (Scoggan, 1949); Gillam, about 165 miles south of Churchill, mixed woods (Krivda, 1954). First report: the present publication.

(Subarctic-)temperate American: B.C. to central Man., n. Que., and Nfld., s. to Minn. and Va.; e. Asia.

## 3. SELAGINELLACEAE

### (Spikemoss Family)

### 1. Selaginella Beauv.

### (Spikemoss)

1. Spikes subcylindric, neither its sporophylls nor the stem-leaves bristle-tipped; stem rooting only at the base of the upright fertile branches; plant of the Hudson Bay and northern interior regions........................................1. *S. selaginoides*

1. Spikes strongly 4-angled, their sporophylls and the stem-leaves bristle-tipped; stem freely rooting throughout........................................2. *S. rupestris*

1. **S. selaginoides** (L.) Link

The following are the only two collections thus far made in Manitoba: Churchill, moist mossy ground (Dore, 1949); Gillam, rare among mosses in damp seepage area (Schofield, 1950). First report: Churchill [Ritchie, 1956].

Subarctic circumpolar: n. interior Alaska, Great Bear L., and Lake Athabasca to n. Man. and central Lab., s. to s. B.C., Colo., Minn., and Me.; s. Greenland; Iceland; Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XIV], to which should be added dots indicating the Churchill and Gillam stations in Manitoba.

2. **S. rupestris** (L.) Spring

Dry sandy or rocky open habitats throughout southern and central Manitoba. Northernmost collection: Norway House, granite outcrop (Scoggan, 1948). Earliest collection seen: Sewell (now Camp Hughes) near Carberry (Macoun, 1876). First report: Carberry [Christy, 1887]. Basis of reports of *S. densa* Rydb. from the province.

(Subarctic-)temperate American: s. B.C. to Lake Athabasca, central Man., and e. Que., s. to Wash., Utah, N.M., Ark., Ga., and N.E.; s. Greenland. A map of the area of the species in the narrow sense is given by Böcher [Meddel. om. Grønland 147, No. 3, fig. 2, 1948], on which the occurrence of the plant in Manitoba should be indicated.

The range in Canada of *S. rupestris* is given by Fernald [1950] as Manitoba to Quebec, and that of *S. densa* by Rydberg [1932] as Manitoba to British Columbia. The writer is unable to note any significant difference between the eastern and western plants in the collection of the National Museum of Canada. Habit, coloration, leaf-shape, and bract-shape do not appear to vary between the two groups to any greater extent than within each group. Rydberg gives the length of the apical bristle of the leaves of *S. densa* as 3 mm. or less, of *S. rupestris* about 0·6 mm., but Gleason [1952] credits the latter with a bristle-length of 1-1·5 mm. The western material in the National Herbarium varies between 0·5 mm. and 1·25 mm. in this character. Reeve [1935] has credited the macrospores of *S. rupestris* with a diameter of 300 to 500 microns; of *S. densa*, 350 to 390 microns. The 11 sheets of Manitoba material in the National Herbarium, however, ranged from 390 to 550 microns in macrospore diameter.

*S. apoda* (L.) Spring has been listed by Jackson *et al.* [1922] as occurring in northwestern Manitoba. This is a considerable extension northeastward from the general area, and, as no specimens are extant, this species may well be excluded from the flora of the province.

## 4. ISOËTACEAE

(Quillwort Family)

### 1. ISOËTES L.

(Quillwort)

1. **I. echinospora** Dur. var. **braunii** (Dur.) Engelm. (*I. braunii* Dur.)

Of wide range in Manitoba, in shallow water, but thus far collected at only a few scattered stations. Northernmost collection: Baralzon Lake, lat. 60° 00′ N. (Scoggan & Baldwin, 1950). Earliest collection seen: Brereton Lake, Whiteshell Forest Reserve (Sparling, 1945). First report: Caddy Lake, se. Man. [Lowe, 1943]. The only other collections are from Reindeer Lake, lat. 57° 54′ N., and Cochrane River, lat. 58° 54′ N. (Baldwin, 1951).

Subarctic American: Aleutian Is., Alaska Pen., Great Bear L., n. Man., Lab., and Nfld., s. to Calif., Colo., n. Ind., Pa., and N.J.; w. and s. Greenland.

## 5. OPHIOGLOSSACEAE

(Adder's-tongue Family)

### 1. BOTRYCHIUM Sw.

(Moonwort. Grape Fern)

[*See* Clausen, 1938.]

1. Stipe (common stalk of fertile and sterile blades) much shorter than the sterile blade,
   the latter 3-pinnate to 4-pinnatifid, with a stalk 3-8 cm. long........................
   ........................................1. *B. multifidum* var. *intermedium*
   ........................................
1. Stipe equalling or exceeding the sterile blade, or, if shorter, the sterile blade 1-pinnate
   with fan-shaped subentire divisions.
   2. Sterile blade 1-pinnate, oblong to subdeltoid in outline.
      3. Pinnae overlapping to slightly remote, fan-shaped or semicircular, entire or only
         ........................................2. *B. lunaria*
         shallowly toothed or notched........................................
      3. Pinnae remote, cut into oblong or obovate, entire to pinnatifid segments.........
         ........................................3. *B. matricariaefolium*
         ........................................
   2. Sterile blade ternate, deltoid in outline, the basal pinnae bipinnate-pinnatifid.......
      ........................................4. *B. virginianum*
      ........................................

1. **B. multifidum** (Gmel.) Rupr. var. **intermedium** (D. C. Eaton) Farw. (Subsp. *silaifolium* (Presl) Clausen) Leathery Grape-Fern

Fields, pastures, and moist open woods of the southern area. Northernmost collection: The Pas, sandy-loam soil (Krivda, 1953). Earliest collection seen: Griswold, 20 miles southwest of Brandon (Burman, 1888). First report: Arrow River, Selkirk, Griswold, and Grand Rapids [Lowe, 1943].

(Subarctic-)temperate American: eastern Aleutian Is. [Hultén, 1941] and B.C. to N.S., s. to Calif., Mont., Ill., and N.J.; e. Asia [Hultén, 1941]; with the species, subarctic circumpolar. A map of the North American area is given by Clausen [1938, p. 25, fig. 1], to which should be added dots representing the above Manitoba distribution.

The report of *B. ternatum* (Thunb.) Sw. for Manitoba [Burman, 1910] was undoubtedly based upon the above Griswold collection, originally so labelled. The report of *B. ternatum* var. *lunarioides* Willd. at Carberry [Christy, 1887] also probably relates to the present species, as does Jackson's [1922] report of *B. obliquum* Muhl. for Manitoba. A puzzling report of the latter for York Factory is given by Macoun [1890], for which there appears to be no specimen extant. This is well outside the area indicated by Clausen [1938, p. 55, fig. 9] for *B. dissectum* var. *obliquum* (Muhl.) Clute.

2. **B. lunaria** (L.) Sw. (Incl. f. *minganense* (Vict.) Clute) Moonwort

Fields, rock outcrops, and sandy shores throughout southern and central Manitoba. Northernmost collection: Churchill (several collections, the first being that of Bell in 1884). Earliest collection seen: "Flat Creek, Man." (Macoun, 1879). First report: "Winnipeg [Bourgeau, *in* Palliser, 1863].

(Arctic-)subarctic circumpolar: central Alaska and Yukon to Great Bear L., n. Man., n. Lab., and Nfld., s. to Calif., Ariz., Colo., Minn., and Me.; southern half of Greenland; Iceland; Eurasia. A map of the North American distribution is given by Clausen [1938, p. 63, fig. 11], to which should be added dots indicating a general distribution throughout Manitoba south of the indicated Churchill station.

3. **B. matricariaefolium** A. Br.

Represented by only one collection: Norway House, granite outcrop (Scoggan, 1948). First report: the present publication.

(Subarctic-)temperate circumpolar: Alta. to s. Lab. and Nfld., s. to Ida., S.D., Ohio, and Va.; Eurasia. A map of the North American distribution is given by Clausen [1938, p. 83, fig. 16], to which should be added a dot indicating the above Manitoba station.

4. **B. virginianum** (L.) Sw. Rattlesnake-Fern

Woodland habitats of southern and central Manitoba. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Hill Portage above Oxford House (McTavish, 1853 or 1854). First report: Oxford House to Knee Lake [Bell, 1881].

Temperate circumpolar, but with large gaps: s. B.C. to P.E.I., s. to Calif. and Fla.; Eurasia. A map of the circumpolar area is given by Clausen [1938, p. 95, fig. 18].

### ***Ophioglossum*** L.

*Ophioglossum vulgatum* L. var. *pseudopodum* (Blake) Farw., Adder's-tongue, is represented in the herbarium of McGill University, Montreal, by a specimen from "Rainy River, Lake of the Woods, Man." collected by Dawson in 1873. The lower part of Rainy River, however, forms the boundary between present-day Ontario and Minnesota, and the specimen in question is presumably an Ontario collection. The species should be searched for in southeastern Manitoba.

## 6. OSMUNDACEAE

(Flowering Fern Family)

### 1. OSMUNDA L.

(Flowering Fern)

1. **O. claytoniana** L. Interrupted Fern

Known thus far only from damp shaded woods and thickets of southeastern Manitoba on and below Lake Winnipeg (Victoria Beach, Brokenhead, Caddy Lake, and Sandilands Forest Reserve). Earliest collection seen: Caddy Lake (Leach, 1940). First report: Lake Winnipeg [Jackson *et al.*, 1922].

(Subarctic-)temperate eastern American: se. Man. to s. Lab. and Nfld., s. to Ark. and Ga.

*O. regalis* (presumably var. *spectabilis* (Willd.) Gray) is cited by Macoun [1890] from Muskeg Island, Lake Winnipeg, and is probably the basis of Burman's [1910] report of this plant for Manitoba. Until such time as supporting specimens are located, it seems best to exclude this species from the provincial flora.

*O. cinnamomea* is included in Burman's checklist, but, as pointed out by Lowe [1943], the specimens in the Burman collection are from Sault Ste. Marie, Ontario.

## 7. POLYPODIACEAE

### (Fern Family)

1. Sori (clusters of fruit-dots) enclosed in globular bead-like segments of the much modified and contracted fertile fronds, these becoming blackish in age.
2. Fronds (the leaf-like portion of ferns) scattered along the creeping rootstock, the sterile ones 1-pinnatifid, net-veined, the fertile 2-pinnate..........1. *Onoclea*
2. Fronds borne in a crown, the free-veined regularly pinnate sterile ones forming a circle around the fertile ones..........2. *Matteuccia*
1. Sori exposed or merely covered by the reflexed margin of the frond.
3. Sterile and fertile fronds very dissimilar, the sterile 2-3-pinnate, the fertile 2-4-pinnate; sori forming a continuous line under the revolute margin of the linear fertile segments..........3. *Cryptogramma*
3. Sterile and fertile fronds alike or essentially so.
4. Indusia (the covering over the sori) lacking or soon shrivelling; sori roundish.
5. Fronds evergreen, deeply 1-pinnatifid with mostly entire lobes....4. *Polypodium*
5. Fronds not evergreen, 2-4 times pinnatifid or pinnate..........5. *Dryopteris*
4. Indusia normally present.
6. Sori confluent in marginal lines, covered by the revolute edge of the frond, these coarse to leathery in texture.
7. Stipe (stalk of the frond) purplish to blackish, the main axis simple; ultimate segments of frond distinct; rootstock very short, the fronds mostly clustered..........6. *Pellaea*
7. Stipe light brown, mostly 3-forking below the blade-bearing portion; ultimate segments of frond confluent along rachis; rootstock elongate, the fronds scattered..........7. *Pteridium*
6. Sori distinct (sometimes confluent in age), borne on the under side of the frond.
8. Indusium borne beneath the sorus, hood-like or splitting into elongate segments.
9. Indusium hood-like or arched, attached by the side nearest the midrib; stipes continuous with the rootstock..........8. *Cystopteris*
9. Indusium symmetrical, soon splitting into elongate segments; stipes (in ours) articulated near base..........9. *Woodsia*
8. Indusium spreading from above or from one side over the sorus.
10. Indusium attached at its centre, roundish or kidney-shaped, with a deep sinus or cleft at one side..........5. *Dryopteris*
10. Indusium attached by its margin, linear to oblong..........10. *Athyrium*

### 1. ONOCLEA L.

### (Sensitive Fern)

1. **O. sensibilis** L.

Wet woods and thickets of southeastern Manitoba. Northernmost collection: Sasaginnigak Lake, east of The Narrows of Lake Winnipeg (Breitung, 1949). Earliest collection seen: High Lake (Lowe, 1921). First report: Winnipeg [Bourgeau, in Palliser, 1863].

(Subarctic-)temperate eastern American: se. Man. to s. Lab. and Nfld., s. to Tex. and Fla.

### 2. MATTEUCCIA Todaro

### (Ostrich-Fern)

1. **M. struthiopteris** (L.) Todaro var. **pensylvanica** (Willd.) Morton (*Pteretis nodulosa* (Michx.) Nieuwl.; *P. pensylvanica* (Willd.) Fern.)

Damp woods and thickets throughout the southern half of Manitoba. Northernmost collection: Hill Lake, 30 miles north of Lake Winnipeg, limestone shingle at entrance of Minago River (Scoggan, 1948). Earliest collection seen: Elm Park, Winnipeg (Macoun, 1896). First report: along the Assiniboine River, from Winnipeg to the Souris River [Macoun, 1890; as *Onoclea struthiopteris*].

(Subarctic-)temperate American: central Alaska to n. Alta., s. James Bay, and Nfld., s. to s. B.C., S.D., Mo., and Va.; with the species, circumpolar.

Forma *pubescens* (Terry) Clute, with tomentose rachises, has been collected at Winnipeg, Gimli, Victoria Beach, Brandon, and McMunn.

### 3. CRYPTOGRAMMA R. Br.

### (Rock-brake)

1. **C. crispa** (L.) R. Br. var. **acrostichoides** (R. Br.) Clarke. (*C. acrostichoides* R. Br.)

Rock crevices throughout the Precambrian formations of southeastern to northwestern Manitoba. Northernmost collection: Reindeer Lake, lat. 57° 57′ N. (Baldwin, 1951). Earliest collection seen: Berens River (Macoun, 1886). First report: "Between Echimamish River and Oxford House, and around Cross Lake and on Nelson River near Hudson Bay." [Macoun & Burgess, 1885].

Subarctic western American: Seward Pen., Alaska, to Great Bear L. and n. Man., s. to Ont. and Mich., and in the mts. to Calif. and N.M.; ne. Asia; with the species, circumpolar.

### 4. POLYPODIUM L.

### (Polypody)

1. **P. virginianum** L. (*P. vulgare* L. var. *virginianum* (L.) Eaton) Rock-Polypody

Rock crevices throughout the Precambrian formations of southeastern to north-central Manitoba. Northernmost collection: Churchill (Porsild, 1930). Earliest collection seen: Nelson River (Bell, 1880). First report: Cross Lake, northeast of Lake Winnipeg [Bell, 1881].

(Subarctic-)temperate American: Great Bear L. to n. Man. and Nfld., s. to B.C., Ark., and Va.; e. Asia; closely related to the Eurasian *P. vulgare* L., together with which a map (in need of revision) is given by Fernald [1929, map 7].

### 5. DRYOPTERIS Adans.

### (Shield-Fern. Wood-Fern)

1. Rhizome (rootstock) cord-like and creeping, the fronds scattered or only sparsely tufted; indusia wanting or soon shrivelling.
   2. Indusia present but soon shrivelling; sterile and fertile lanceolate fronds more or less dimorphic, the pinnae of the latter often scythe-shaped and curved downward, with narrower and commonly revolute-margined lobes......1. *D. thelypteris* var. *pubescens*

2. Indusia none; the triangular to triangular-ovate fronds not dimorphic.
3. Pinnae all sessile, the lowest pair projected downward and forward, somewhat remote from the confluent upper ones........................7. *D. phegopteris*
3. Pinnae not all sessile, the lowest pair (and sometimes the next upper pair) slender-petioled, the frond thus appearing more or less ternate (3-divided), only the uppermost pinnae or segments confluent.
4. Fronds thin and soft, glabrous, the three divisions nearly equal; stipe and rachis glabrous and shining........................2. *D. disjuncta*
4. Fronds firm and stiffish, glandular-puberulent, the terminal division the longest; stipe and rachis dull, puberulent........................3. *D. robertiana*

1. Rhizome stout, covered with bases of old stipes, broadly linear to deltoid-ovate, the firm fronds forming terminal crowns; indusia present.
5. Indusia densely crowded and overlapping; fronds glandular and spicy-aromatic, broadly linear to lanceolate, 0·7-3 dm. long, heavily chaffy with cinnamon-brown to reddish scales, the old shrivelled and curled ones largely persistent; plant of dry rocky habitats........................4. *D. fragrans* var. *remotiuscula*
5. Indusia not overlapping; fronds neither glandular nor especially aromatic, normally taller and less chaffy; chiefly woodland.
6. Sori marginal; fronds lanceolate to oblong-ovate, up to 7 dm. long, firm to leathery in texture, blue-green to grey-green in colour........................*D. marginalis*
6. Sori not marginal.
7. Teeth of ultimate segments ending in bristle-like tips; fronds lance-oblong to deltoid-ovate, the sterile and fertile essentially equal........................5. *D. spinulosa*
7. Teeth of segments not bristle-tipped; fronds linear-oblong to narrowly lance-oblong, dimorphic, the fertile much taller, their pinnae twisted in a horizontal plane........................6. *D. cristata*

1. **D. thelypteris** (L.) Gray var. **pubescens** (Lawson) Nakai (*Thelypteris palustris* Schott) Marsh-Fern

Wet woods and marshy ground of southeastern Manitoba (Riverton, Seven Sisters Falls, Whiteshell Forest Reserve, Sandilands Forest Reserve). Earliest collection seen: Sandilands Forest Reserve (Dudley, 1930). First report: "Near Red River Settlement, Man." [Macoun, 1890; as *Aspidium Thelypteris* Sw.].

Temperate eastern American: se. Man. to s. Nfld., s. to Okla., Tenn., and Ga.; with the species, circumpolar.

2. **D. disjuncta** (Ledeb.) C.V.Mort. (*Gymnocarpium dryopteris* Newm.; *D. linnaeana* Christens.) Oak-Fern

Damp woods, southeastern to northern Manitoba. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet black spruce woods (Baldwin, 1951). Earliest collection seen: Loon Strait, Lake Winnipeg, damp woods (J. M. Macoun, 1884). First report: Winnipeg and N. W. Angle Road [Dawson, 1875; as *Polypodium Dryopteris* L.].

(Arctic-)subarctic circumpolar: central Alaska and Yukon to n. Man., n. Que., Lab., and Nfld., s. to Oreg., Ariz., Ia., and Va.; s. Greenland; Iceland; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIII].

3. **D. robertiana** (Hoffm.) Christens. (*Gymnocarpium robertianum* (Hoffm.) Newm.)

Of wide distribution in the forested areas of the province, but little collected. Northernmost collection: Reindeer Lake, lat. 57° 19′ N., rocky hillside (Baldwin, 1951). Earliest collection seen: Pipestone Lake, about 55 miles northeast of Lake Winnipeg, rock crevice (Scoggan, 1948). First report: Lake of the Woods, Man. [Macoun, 1890].

Subarctic circumpolar: n. Alaska and Yukon to s. Keewatin and Nfld., s. to B.C., Ida., Ia., and Pa.; Eurasia.

4. **D. fragrans** (L.) Schott var. **remotiuscula** Kom. Fragrant Cliff-Fern

*Aspidium fragrans* is listed, without locality, by Burman [1910], but the only specimen seen by the writer was collected on rock outcrops of Reindeer Lake, lat. 57° 19′ N. (Baldwin, 1951). First report: Reindeer Lake [Baldwin, 1953]. Basis of reports of the main form from the province.

Subarctic American: central Alaska and Yukon to s. Keewatin, s. Lab., and Nfld., s. to Minn. and N.Y.; e. Asia; with the species, for which the northern part of the American area is mapped by Raup [1947, pl. XIII], circumpolar. [*See* Raymond, 1950, fig. 13].

5. **D. spinulosa** (O. F. Muell.) Watt. Spinulose Wood-Fern

Throughout the forested area of southern and central Manitoba. Northernmost collection: Cross Lake, about 60 miles northeast of Lake Winnipeg, wooded island (Scoggan, 1948). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1857). First report: Burman [1910].

(Arctic-)subarctic circumpolar: n. Alta. to s. James Bay, n. Lab., and Nfld., s. to Ida., Mo., and Va.; s. Greenland; Eurasia.

6. **D. cristata** (L.) Gray Crested Wood-Fern

Damp woods and thickets of southern Manitoba. Northernmost collection: Porcupine Mountain, low thicket (Macoun, 1881). Earliest collection seen: the foregoing specimen. First report: "Winipeg" [Bourgeau, in Palliser, 1863; as *Lastrea cristata*].

(Subarctic-)temperate ?circumpolar: Alta. to Nfld., s. to Ida., Neb., n. La., and Va.; Europe.

7. **D. phegopteris** (L.) Christens. (*Thelypteris phegopteris* (L.) Slosson; *Phegopteria polypodioides* Fée) Long Beech-Fern

A single specimen has been seen, from Tod Lake, near the Saskatchewan boundary, about lat. 57° N., where it was collected in wet silty soil near a small beaver dam by J. C. Ritchie in 1955. First report: "rather scarce along Lake Manitoba and the Porcupine Mountains" [Macoun, 1890].

(Arctic-)subarctic circumpolar: Alaska to n. Sask., middle Hudson Bay, n. Lab., and Nfld., s. to Oreg., Ia., Ind., Tenn., and N.C.; w. and e. Greenland; Iceland; n. Eurasia.

*D. marginalis* (L.) Gray is also included in Burman's checklist (as *Aspidium marginale*), and noted by Macoun [1890] as occurring "along the Dawson Road, Man." in the southeast. Here, again, specimens are lacking, and the species must be excluded for the present.

*D. filix-mas* (L.) Schott is recorded by Lowe [1943] from Riding Mountain, but no specimen is available. A specimen so labelled, from Shoal Lake, southeastern Manitoba, proved to be not this species, which must, therefore, be excluded from the flora of the province.

## 6. PELLAEA Link

(Cliff-Brake)

1. **P. glabella** Mett. (*P. atropurpurea* (L.) Link var. *bushii* Mack.)

Collected on limestone outcrops at only the following localities: Stony Mountain, near Winnipeg (Lowe, 1939; this is the plant treated by Lowe [1943] as *P. atropurpurea*); Grand Rapids, near the northwest end of Lake Winnipeg (Scoggan, 1948); rocky lake 14 miles north of The Pas, limestone cliff (Bird, 1953). First report: the present publication; but the plant listed by Burman [1910] as *P. atropurpurea* is referable here.

(Subarctic-)temperate western American: s. Mack. and L. Athabasca to central Man., s. to Colo., Ark., and Va.

## 7. PTERIDIUM Gled.

(Bracken)

1. Indusia glabrous and non-ciliate; pinnules glabrous or nearly so........................................................................1. *P. aquilinum* var. *latiusculum*

1. Indusia ciliate and more or less woolly-hairy; pinnules more or less tomentose................................................................1a. *P. aquilinum* var. *pubescens*

1. **P. aquilinum** (L.) Kuhn var. **latiusculum** (Desv.) Underw.

Dry, sandy clearings, thickets, and open woods of southern Manitoba. Northernmost collection: Loon Strait (south of The Narrows), Lake Winnipeg, sandy woods (Macoun, 1884). Earliest collection seen: the foregoing specimen. First report: various localities [Groh, 1944]. Basis of reports of the main form from the province.

(Subarctic-)temperate ?circumpolar: s. Man. to Nfld., s. to Colo., Okla., Miss., and Pa.; Eurasia. Extensive gaps occur in the distribution, as shown by Tryon's map [Rhodora 43, p. 42. map 8], to which dots should be added indicating the occurrence in southern Manitoba.

1a. **P. aquilinum** var. **pubescens** Underw.

Known in the province only from the following collection: Brokenhead, about 25 miles east of Selkirk, dry sandy clearing (Scoggan, 1953). First report: the present publication.

(Subarctic-)temperate American: s. Alaska (about lat. 57° N.) to s. B.C., s. Man., the Great Lakes region, and s. Que., s. to Calif. and Mex. A dot should be added to Tryon's map [Rhodora 43, p. 24, map 3] to indicate the occurrence in southern Manitoba, bridging the large gap between the western and Great Lakes stations.

Var. *champlainense* Boivin, intermediate in characters between the above varieties, is reported from Hadashville, about 50 miles east of Winnipeg [*see* Boivin, Am. Fern Jour. 42: 131-133. 1952].

### 8. CYSTOPTERIS Bernh.

### (Bladder-fern)

1. Fronds lanceolate, broadest at base, often bearing bulblets on the under side, the fertile ones mostly narrower than the sterile and prolonged-attenuate to tip; veins mostly ending at the sinuses....................1. *C. bulbifera*
1. Fronds lanceolate to lance-oblong, broadest above the base, the sterile and fertile ones similar; veins mostly extending to the teeth....................2. *C. fragilis*

1. **C. bulbifera** (L.) Bernh. Bulblet-Fern

The single specimen seen is one in the herbarium of the Manitoba Provincial Museum, bearing the following annotation: Eastern Manitoba, M. W. Hutchinson, July 22, 1944. The only other basis for the acceptance of this plant as a constituent of our flora is the inclusion of Manitoba in its range by Fernald [1950]. Jackson *et al.* [1922] report it from Lake of the Woods, but this is doubtless based upon the citing of the plant by Macoun [1890] from "North-west Angle, Lake of the Woods", an isolated part of present-day Minnesota. Fernald's citation may also be based upon this misleading report. Further collections of this species are desirable to remove all doubt as to its occurrence in the province.

(Subarctic-)temperate American: Man. to Nfld., s. to Ariz., Ark., and Ga.

2. **C. fragilis** (L.) Bernh. Fragile Fern

Rocky woods almost throughout the forested parts of the province. Northernmost collection: Churchill (several collections, the earliest by A. E. Porsild in 1930). Earliest collection seen: Doghead Point, Lake Winnipeg, crevices of rocks (Macoun, 1884). First report: Churchill River [Bell, 1880].

Arctic circumpolar: n. coast of Alaska and Mack. to Banks I. and n. Ellesmereland, s. to Calif., Tex., Mo., and Va.; southern half of Greenland; Iceland; Spitsbergen; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIII].

Var. *dickieana* (Sim.) Moore (*C. dickieana* Sim.), differing from the main form chiefly in the texture of the spore wall, is reported from Churchill and near The Pas by Ritchie [1956].

### 9. WOODSIA R. Br.

### (Woodsia)

1. Stipes jointed near the base.
    2. Stipes chaffless or with only a few scattered scales.
        3. Indusia of 5-8 short filamentous segments; stipes green or straw-colour....................1. *W. glabella*
        3. Indusia of 10-20 long curving filamentous segments overtopping the mature sporangia; stipes brown....................3. *W. alpina*
    2. Stipes very chaffy, at least when young....................2. *W. ilvensis*
1. Stipes not jointed....................*W. oregana*

1. **W. glabella** R. Br. Smooth Woodsia

The only specimens seen were collected by the writer on limestone outcrops of central Manitoba: Grand Rapids (1948); Wekusko Lake (1949); Tramping Lake, west of Wekusko Lake (1949). The earliest report is that of Jackson *et al.* [1922], but no localities are given and supporting specimens appear to be lacking.

Arctic circumpolar: n. coast of Alaska and Mack. to Banks I. and central Ellesmereland, s. to B.C., Minn., and N.Y.; circumgreenlandic; Iceland; Spitsbergen; Eurasia.

2. **W. ilvensis** (L.) R. Br. Rusty Woodsia

Rock outcrops throughout the Precambrian formations of southeastern, central, and northern Manitoba. Northernmost collection: Cochrane River, lat. 58° 31′ N., rock crevices (Baldwin, 1951). Earliest collection seen: Bloodvein River, near The Narrows, Lake Winnipeg, rock crevices (Macoun, 1884). First report: Lake Winnipeg [D.C. Eaton, Can. Nat. 2 (ser. a): 90. 1865].

Arctic circumpolar: Seward Pen., Alaska, to Coronation Gulf and central Baffin I., s. to B.C., Man., Ia., and N.C.; southern half of Greenland; Iceland; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XIII].

3. **W. alpina** (Bolton) S. F. Gray Northern Woodsia

A single specimen has been seen, from Tod Lake, near the Saskatchewan boundary at about lat. 57° N., where it was collected on shaded, south-facing cliffs by J. C. Ritchie in 1955. First report: Norway House [Macoun, 1890; as *W. hyperborea*]. Reported also from Flin Flon by Lowe [1943].

Arctic circumpolar: north-central Alaska, Mack. R. Delta, and Coronation Gulf to central Ellesmereland, south-central Baffin, n. Lab., and Nfld., s. (including *W. bellii* (Lawson) Porsild) to n. Minn. and n. Vt.; Greenland; Iceland; n. Eurasia.

*W. oregana* D. C. Eat. is listed by Jackson *et al.* [1922], but without locality. There are no supporting specimens.

### 10. Athyrium Roth

1. **A. filix-femina** (L.) Roth var. **michauxii** (Spreng.) Farw. (*A. angustum* (Willd.) Presl) Lady-Fern

Damp thickets and open woods of southeastern and central Manitoba. Northernmost collection: Hayes River near Swampy Lake, midway between Norway House and York Factory (Scoggan, 1949). Earliest collection seen: Observation Point, Lake Winnipeg, swampy woods (Macoun, 1884). First report: "Que. to c. Man." [Fernald, 1950; but presumably the "*Asplenium Filix-foemina*" noted by Macoun, 1890, as "Common in wooded parts of Manitoba..."].

Subarctic eastern American: central Man. to central Lab. and Nfld., s. to S.D., Mo., and Va.; the collective species subarctic circumpolar. Several forms of this variety have been described, but, according to Gleason [1952], they appear to be mere ecological variations.

### *Asplenium* L.

*Asplenium trichomanes* L., Maidenhair-Spleenwort, is included by Lowe [1943] in his checklist of Manitoba plants, but in the absence of supporting specimens must be excluded for the present from our flora.

### *Marsilea* L.

*M. mucronata* A. Br., Pepperwort, is included by Burman [1910] in his checklist of the province, but is cited only from Froude, Saskatchewan, by Jackson *et al.* [1922]. There is no evidence that it occurs in Manitoba.

## Division II. **SPERMATOPHYTA** (Seed-Plants)

## Subdivision I. *GYMNOSPERMAE* (Gymnosperms)

### 8. TAXACEAE

(Yew Family)

### 1. TAXUS L.

(Yew)

1. **T. canadensis** Marsh. Ground Hemlock

Apparently limited in Manitoba to the forested area southeast of Lake Winnipeg, where it was first collected in 1920 near the Ontario boundary by Lowe and Scott. There is, however, a puzzling specimen in the National Herbarium bearing the annotation "Near York Factory, moist banks and hills, R. Bell, Aug. 1880", which is the basis of the citation of this species from York Factory by Macoun [1886]. This locality, however, is far north of the main area of the species, and, together with the fact that the plant is not mentioned in Macoun's appendix to Bell's report [1881] of plants collected along the Hayes system, undoubtedly indicates a confusion of labels (*see* discussion under *Pinus resinosa*).

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Ia. and Va.

### 9. PINACEAE

(Pine Family)

1. Leaves linear or needle-like, mostly more than 1 cm. long, clustered or alternate.
  2. Leaves in clusters of two or more.
    3. Leaves in clusters of 2 or 5, evergreen, the clusters sheathed at base ...... 1. *Pinus*
    3. Leaves many in a cluster, deciduous, the cluster without a sheath ........ 2. *Larix*
  2. Leaves attached singly to the branches.
    4. Leaves 4-angled, not appearing 2-ranked; leaf-traces prominent; cones drooping, not falling apart at maturity .......................................... 3. *Picea*
    4. Leaves flat, appearing 2-ranked, whitened along 2 lines underneath; leaf-traces not prominent; cones erect, the axis persistent after the fall of the scales..... 4. *Abies*
1. Leaves scale-like or awl-shaped, 1 cm. long or less, opposite or whorled.
  5. Fruit a small dry cone of 8-12 scales; branchlets flattened; medium-sized tree ....... ........................................................... 5. *Thuja*
  5. Fruit berry-like, blue; branchlets not flattened; ascending or trailing shrubs......... ........................................................... 6. *Juniperus*

### 1. Pinus L.

### (Pine)

1. Leaves 5 in a cluster; cones subcylindrical, nodding, 6-25 cm. long, their scales thin; wood soft........1. *P. strobus*
1. Leaves 2 in a cluster; cone-scales thickened at the end; wood hard.
    2. Leaves 7-17 cm. long; cones ovoid-conical, about 5 cm. long, terminal or almost so........2. *P. resinosa*
    2. Leaves 2-4 cm. long, thick and rigid, twisted and spreading; cones conical, usually curved, lateral at maturity........3. *P. banksiana*

1. **P. strobus** L. White Pine

Confined to the extreme southeast corner of Manitoba, within the Rainy River Section of the Great Lakes – St. Lawrence Forest Region of Halliday [1937, with map]. Earliest collection seen: Lake of the Woods, Man. (Jackson; undated, but probably the basis of the report of Jackson *et al.* that the species just enters the eastern boundary). First report: Bell [1882, map showing northern and western limits].

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Ia., Tenn., and Ga. A map of the distribution is given by Munns [1938]. The greater part of the area is shown in a map of the Dominion Forest Service [1949].

2. **P. resinosa** Ait. Red or Norway Pine

Like white pine, confined to the southeastern corner of the province, chiefly within Halliday's Rainy River Section, with the exception of a stand on Black Island, near Hecla Island, Lake Winnipeg [Bell, 1897], that, following inquiries of the writer, was still in existence in 1953. This locality lies within the Manitoba Lowlands Section of Halliday's coniferous Boreal Forest Region. Earliest collection seen: this may be taken to be a specimen in the National Herbarium collected by Bell in 1880, although the citation "Hill River, Hudson's Bay" (an old name for that part of the Hayes River between Swampy Lake and the mouth of Fox River) indicates beyond a doubt that, as in the case of the citation of *Taxus canadensis* from York Factory, there has been a confusion of labels. The specimen was probably collected in southeastern Manitoba, as Bell [1881] notes the fact that there was a month's delay in his embarking for Norway House, during which time he made collections of natural history specimens in the Winnipeg area. The species is not mentioned in Macoun's appendix to Bell's report of plants collected along the Hayes system. First report: Bell [1882, map showing northern and western limits].

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Minn., Mich., W. Va., and Pa. Maps of the area are given by Fernald [Rhodora 13. pl. 89, fig. 8], Munns [1938], and the Dominion Forest Service [1949].

3. **P. banksiana** Lamb. Jack-Pine

Dry, sandy soil and rocky substrata almost throughout the province, particularly in burned-over areas, but not yet recorded north of Kettle Rapids on the Hudson Bay Railway [Stevenson, 1938] in the section east of Nueltin Lake, nor in the southwestern prairie region (although thriving in a plantation in the Spruce Woods Forest Reserve southeast of Brandon). Northernmost collection: Nueltin Lake, lat. 59° 43′ N., dry sandy hillside (Baldwin, 1951). Earliest collection seen: "Hill River, Hudson's Bay" (the part of the Hayes system between Swampy Lake and the mouth of Fox River), rocky banks (Bell, 1880). First report: "Lake Winipeg" [Bourgeau, in Palliser, 1863].

Subarctic American: Mackenzie R. west of Great Bear L. to n. Man. and the Côte Nord, Que., s. to Alta., Minn., Ill., and n. N.Y. Maps of the distribution are given by Munns [1938], the Dominion Forest Service [1949], and Halliday & Brown [1943, showing population intensity], and of the northern limits by Bell [1882, 1897] and Hustich [1953].

### 2. LARIX Mill.

(Larch. Tamarack)

1. **L. laricina** (DuRoi) K. Koch

Muskeg or swampy areas throughout the province except in the southwestern prairie region, where it is reported only from a swamp in Spruce Woods Forest Reserve southeast of Brandon [Bird, 1927]. Northernmost collection: Baralzon Lake, lat. 60° 00′ N., with black spruce in scattered stands on the arctic tundra (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: York Factory [Richardson, in Franklin, 1823; as *Pinus microcarpa* Lamb.].

(Arctic-)subarctic American: central Alaska, Mack. R. Delta, and Great Bear L. to s. Keewatin, n. Lab., and Nfld., s. to central B.C., se. Man., Ill., and Pa. Maps of the distribution are given by Munns [1938] and the Dominion Forest Service [1949], and of the northern limits by Bell [1882, 1897] and Hustich [1953]. The northwestern American plant has been segregated, at least in part, as var. *alaskensis* (Wight) Raup [*see* Raup 1947, p. 105 and pl. XIV]. Raup is of the opinion that this variety "will appear far eastward in the range of the species, particularly in northern latitudes". The writer, however, is unable to see in his northern Manitoba material other than the typical form.

### 3. PICEA Dietr.

(Spruce)

1. Branchlets glabrous; leaves slender, pale or glaucous; cones subcylindrical, about 5 cm. long, deciduous, their 60-90 thin entire-edged pale scales still soft-leathery at maturity ........ 1. *P. glauca*

1. Branchlets pubescent; leaves short and thickish, mostly 6-10 mm. long, pale bluish-green; cones short-ovoid or subglobose, 2-3 cm. long, persisting for several years, their scales about 30, dull greyish-brown, with erose margins (as if gnawed), rigid at maturity ........ 2. *P. mariana*

1. **P. glauca** (Moench) Voss White Spruce

Forests almost throughout the province, except in the extreme northeastern barren grounds and most of the southern prairie region. It occurs, however, at Birds Hill near Winnipeg [Stevenson, 1938], and in a remarkable southern outlying station, in association with *Juniperus horizontalis* and numerous prairie species, on the sandy soil of Spruce Woods Forest Reserve southeast of Brandon. Bird [1930] is of the opinion that its persistence here, following the general re-advance northward of the conifer forest upon the retreat of the Pleistocene ice-sheet, may be due to peculiar edaphic conditions enabling it to survive in otherwise unfavourable surroundings. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., foot of gravel ridge (Baldwin, 1951). Earliest collection seen: Churchill (Polunin, 1936). First report: Bell [1882].

(Arctic-)subarctic American: n. coast of Alaska and Yukon to Great Bear L., s. Keewatin, n. Lab., and Nfld., s. to Wyo., S.D., and ne. N.Y. The northwestern plant has been separated as var. *albertiana* (Brown) Sarg. and var. *porsildii* Raup [*see* Raup, 1947]. Maps of the area are given by Munns [1938], Halliday & Brown [1943; showing population intensity], Raup [1947, pl. XIV], and the Dominion Forest Service [1949], and of the northern limits by Bell [1882, 1897] and Hustich [1953].

2. **P. mariana** (Mill.) BSP. Black Spruce

Muskeg forest and wet places almost throughout the province, but in the southwestern prairie region reported only from a larch swamp in Spruce Woods Forest Reserve [Bird, 1927]. Northernmost collection: Baralzon Lake, lat. 60° 00′ N., isolated stand of small trees on rocky barrens (Scoggan & Baldwin, 1950). Earliest collection seen: Pine Ridge, near Winnipeg, bog (Neatby & Peterson, 1929). First report: [Macoun, 1886; as *P. nigra* Link].

(Arctic-)subarctic American: central Alaska, Mack. R. Delta, and Great Bear L. to s. Keewatin, n. Lab., and Nfld., s. to B.C., Minn., and Va. Maps of the area are given by Munns [1938], Halliday & Brown [1943; showing population intensity], Raup [1947, pl. XIV], and the Dominion Forest Service [1949], and of the northern limits by Bell [1882, 1897] and Hustich [1953].

### 4. Abies Mill.

### (Fir)

1. **A. balsamea** (L.) Mill. Balsam-Fir

Forests of southeastern to low-northern Manitoba, and reported by Bird [1930] from Douglas Lake near Carberry, in the southwestern prairie region. According to Stevenson [1938], the northern limit in the province runs approximately along a line joining the south end of Reindeer Lake on the Saskatchewan boundary to Swampy Lake below Knee Lake on the Hayes River, thence to the Ontario boundary. A report of the species from Churchill by Gardner [1937] is questionable. Northernmost collection: Knee Lake, Hayes River, white spruce forest (Scoggan, 1949). Earliest collection seen: Warren Landing (Lowe, 1918). First report: "...reaches the neighbourhood of the junction of the Shammattawa and Steel Rivers..." [Macoun, 1886]. This, on modern maps, is indicated by the junction of

Gods River with the Hayes, at a distance of only about 50 miles from York Factory. Supporting specimens are necessary before the presence of the species this far north can be accepted as definitely established.

Subarctic American: n. Alta. to s. James Bay, n. Que., central Lab., and Nfld., s. to ne. Ia., O., and Va. Maps of the area are given by Munns [1938], Halliday & Brown [1943; showing population intensity], and the Dominion Forest Service [1949], and of the northern and western limits by Bell [1882, 1897] and Hustich [1953].

## 5. THUJA L.

### (Arbor Vitae)

1. **T. occidentalis** L. White Cedar

Wet ground and damp woods, reaching the western limit of its main area south of Lake Winnipeg and east of Red River. Isolated outliers, however, occur along Warpath River, emptying into the west side of Lake Winnipeg opposite Reindeer Island [Stevenson, 1938], and at Cedar Lake, near the north end of Lake Winnipegosis. The latter station was important in the days of the fur-trade as a source of cedar bark for the repair of canoes on the long voyage between the northwestern posts and York Factory. Northernmost collection: Cedar Lake (Cochrane, 1882). Earliest collection seen: the foregoing. First report: Bell [1882].

(Subarctic-)temperate eastern American: central Man. to s. James Bay and e. Que., s. to Minn., Tenn., and N.C. Maps of the area are given by Fernald [Rhodora 13, pl. 91, fig. 12], Munns [1938], and the Dominion Forest Service [1949], and of the northern and western limits by Bell [1882, 1897] and Hustich [1953].

## 6. JUNIPERUS L.

### (Juniper)

1. Leaves scale-like, crowded and strongly appressed; berry-like fruits terminal in the branchlets; prostrate shrub with trailing branches.................... 1. *J. horizontalis*

1. Leaves linear to linear-subulate, spreading to appressed-ascending, the berry-like fruits sessile in their axils.

 2. Shrub ascending or decumbent; leaves 8-15 mm. or more long, needle-pointed, straight ........................................................ 2. *J. communis*

 2. Shrub very depressed and trailing; leaves 6-9 mm. long, short-pointed, upwardly curved against the branches.......................... 2a. *J. communis* var. *saxatilis*

1. **J. horizontalis** Moench Creeping Savin

Dry woods, sandhills, and sandy clearings of southern and central Manitoba. Northernmost collection: Gillam, about 165 miles south of Churchill, dry woods (Schofield, 1950); the citation from York Factory by Bell [1881] must await supporting specimens. Earliest collection seen: Sewell (now Camp Hughes), east of Brandon, sandhills (Macoun, 1876). First report: north end of Lake Winnipeg [Bell, 1880; as *J. sabina* var. *procumbens*].

(Arctic-)subarctic American: s. Alaska and n. Mack. to Great Bear L., James Bay, and Nfld., s. to Wyo., Ill., and N.Y.

2. **J. communis** L. (Incl. var. *depressa* Pursh) Common Juniper

Dry sandy soil and rock outcrops throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., stony ground (Baldwin, 1951). Earliest collection seen: Victoria Beach (Buller, 1917). First report: north end of Lake Winnipeg [Bell, 1880].

(Subarctic-)temperate ?circumpolar: Alta. to Nfld., s. to Ill. and Ga.; Europe.

2a. **J. communis** var. **saxatilis** Pall. (Var. *montana* Ait.; *J. sibirica* Burgsd.)

Reported from numerous localities by Lowe [1943; as *J. sibirica*], but specimens have been seen from only the following localities: Pine Ridge, near Winnipeg (Neatby & Peterson, 1929; A. & D. Löve, 1952); Melbourne, west of Portage la Prairie (1931; name of collector not given); The Pas (Krivda, 1949); Nelson River at High Rock, about 30 miles northeast of Norway House, dry schists (Scoggan, 1948).

(Arctic-)subarctic circumpolar: n. Alaska and Mack. to s. Keewatin, n. Que., n. Lab., and Nfld., s. to Calif., Wyo., Wisc., and Me.; southern third of Greenland; Iceland; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XV], who notes the occurrence of the variety at Churchill, where it is reported by Gröntved [1936; var. *nana*] as collected by Birket-Smith in 1923. The northern limit of the species as given by Hustich [1953] may be taken as referring to this variety.

*J. virginiana* L. is included in the checklist of Lowe [1943; *Sabina virginiana*], based upon the inclusion by Rydberg [1932] of Manitoba in the range of this species. Gleason [1952] notes the occurrence of this small tree (presumably var. *crebra* Fern. & Grisc.) as far west as North Dakota, but its presence in Manitoba remains to be verified.

## Subdivision II. *ANGIOSPERMAE* (Angiosperms)

## Class I. **MONOCOTYLEDONEAE**

### 10. TYPHACEAE

(Cat-tail Family)

### 1. Typha L.

(Cat-tail)

1. **T. latifolia** L. Common Cat-tail

Swampy ground and edges of ponds, lakes, and streams almost throughout the province. Northernmost collection: Nueltin Lake, lat. 57° 16′ N., marsh (Baldwin, 1951). Earliest collection seen: Lake of the Woods, Man., swamps (Dawson, 1873). First report: " Winipeg" [Bourgeau, in Palliser, 1863].

Subarctic American: s. Alaska to n. Man., James Bay, and Nfld., s. to Mex. Maps of the North American area are given by Hotchkiss & Dozier [Amer. Midl. Nat. 41: 251. 1949] and Raymond [1950, fig. 23].

Forma *ambigua* (Sonder) Kronf., with staminate and pistillate halves of the spike separated by an interval as in *T. angustifolia*, may be distinguished from the latter by the occurrence of its pollen-grains in groups of four, rather than singly. It has been collected at Whitewater Lake, near Boissevain (Neufeld, 1950), and Rufford, about 20 miles north of Brandon (A. & D. Löve, 1952), growing at both places with the typical form.

## 11. SPARGANIACEAE

### (Bur-reed Family)

### 1. Sparganium L.

### (Bur-reed)

1. Stigmas 2; achenes obpyramidal, sessile, up to 8 mm. thick; leaves stiffish, nearly flat; stem stout, erect........................................1. *S. eurycarpum*
1. Stigma 1; achenes about equally narrowed to summit and to the more or less stalked base, rarely more than 2·5 mm. thick; leaves softer and more or less ribbon-like, flat or convex on the back; stems often completely submersed.
   2. Fruiting heads all borne directly in the leaf axils; fruit tapering to a conical beak 0·5-1·5 mm. long; staminate head 1; leaves flat and thin, 1·5-8 mm. broad..................................................5. *S. minimum*
   2. Fruiting heads (or at least 1 of them) borne at a short distance above the leaf axils.
      3. Staminate head 1; fruit beakless at summit; leaves rather thick and opaque, flat, 1-5 mm. broad........................................4. *S. hyperboreum*
      3. Staminate heads 2 or more; fruit conspicuously beaked.
         4. Leaves flat and ribbon-like, 5-12 mm. broad, scarcely dilated at base; pistillate heads 1-5, in maturity 2-2·5 cm. in diameter..........2. *S. multipedunculatum*
         4. Leaves very elongate, convex on the back, 1·5-5 mm. broad, the middle and upper ones with dilated base; pistillate heads 1-3, in maturity 1·2-2 cm. in diameter........................................3. *S. angustifolium*

1. **S. eurycarpum** Engelm.

Shallow water throughout southern and central Manitoba. Northernmost collection: Hill Lake, north of Lake Winnipeg, at entrance of Minago River (Scoggan, 1948). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Lake of the Woods [Dawson, 1875]. A supporting specimen in the herbarium of McGill University bears the annotation "Muskeg Bay, Lake of the Woods, Man., 1873" and was probably collected by Dawson near the old Hudson's Bay Company post on Buffalo Point, just north of the Minnesota boundary.

Subarctic American: central Mack. to n. Alta., central Man., and e. Que., s. to Calif., Kans., Mo., and Fla.

2. **S. multipedunculatum** (Morong) Rydb. (*S. simplex* of Am. auth., in part)

Shallow water, southern Manitoba. Northernmost collection: Riding Mountain (Halliday, 1932) (the citation "Nelson River between Lake

Winnipeg and the coast of Hudson's Bay" by Bell [1880] remains to be verified). Earliest collection seen: Brandon, pool (Macoun, 1896). First report: the foregoing citation by Bell.

Subarctic American: central Alaska to Great Bear L., s. Man., s. Lab., and Nfld., s. to Calif., Colo., s. Ont., and n. N.E.

3. **S. angustifolium** Michx. (*S. affine* Schnizl.)

Shallow water almost throughout the province. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., marshy creek (Baldwin, 1951). Earliest collection seen: Jessica Lake, Whiteshell Forest Reserve (Hinks, 1938). First report: York Factory [Scoggan, 1951].

Subarctic circumpolar: Alaska and Mack. to n. Man., central Lab., and Nfld., s. to Calif., Colo., Minn., and Pa.; s. Greenland; Iceland; Eurasia.

4. **S. hyperboreum** Laestad.

Shallow water throughout the province, except the southwestern prairie section. Northernmost collection: Mosquito Point, 7 miles north of Churchill (Porsild, 1930). Earliest collection seen: Churchill (Macoun, 1910). First report: Fort Churchill [Macoun, 1888; as var. *americanum* Beeby].

(Arctic-)subarctic circumpolar: n. coast of Alaska and Mack. to central Keewatin, n. Que., and n. Lab., s. to n. B.C., s. Man., and Nfld.; sw. Greenland; Iceland; Eurasia.

5. **S. minimum** (Hartm.) Fries

Shallow water throughout the province, except the southwestern prairie section. Northernmost collection: Baralzon Lake, lat. 60° 00′ N. (Scoggan & Baldwin, 1950). Earliest collection seen: Porcupine Mountain and Red Deer Lake (Macoun, 1881). First report: Churchill River [Bell, 1880].

Subarctic circumpolar: central Alaska and Yukon to n. Alta., s. Keewatin, James Bay, and Nfld., s. to Oreg., Utah, Colo., Minn., and Pa.; Eurasia.

*S. androcladum* (Engelm.) Morong is included in the checklist of Jackson *et al.* [1922], with the citation "Cumberland House". This locality is in eastern central Saskatchewan. No Manitoba material has been seen.

## 12. ZOSTERACEAE

### (Pondweed Family)

1. Flowers monoecious, sessile in the leaf axils, subtended by a cup-shaped involucre; fruit slightly curved, the body 2-3 mm. long, with beak 0·8-1·5 mm. long; leaves opposite, long and filiform. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *Zannichellia*
1. Flowers in spikes or on an elongate axis; leaves alternate.
    2. Leaves very long and ribbon-like, 1·5-6 mm. wide; spike hidden in a long sheath-like base of a leaf; flowers monoecious; stigmas 2, bristle-like; northern plant of saline waters of Hudson Bay. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *Zostera*

2. Leaves not ribbon-like, shorter; flowers perfect; mature spike exserted; stigma 1, sessile.
   3. Fruits ovoid, pointed, each on a slender stalk 2-4 cm. long which develops after flowering; leaves linear-capillary, often in fan-shaped groups, their blades 1-2 dm. long; plant of alkaline ponds........................................2. *Ruppia*
   3. Fruits sessile in terminal spikes; leaves filiform to broad; plants of fresh-water ponds and streams............................................3. *Potamogeton*

### 1. ZANNICHELLIA L.

### (Horned Pondweed)

1. **Z. palustris** L.

Shallow water, chiefly alkaline ponds, of southern Manitoba. Northernmost collection: Ebb and Flow Lake, 30 miles southeast of Dauphin Lake, alkaline pond near lake (Scoggan, 1953). Earliest collection seen: Fort Garry (Macoun, 1872). First report: Burman [1910].

Subarctic circumpolar: Alaska to James Bay and Nfld., s. to Mex. and S. Am.; Iceland; Eurasia; Africa.

### *Zostera* L.

*Z. marina* L. is reported by Lowe [1943] "In bays and quiet water along the shore of Hudson Bay and the mouth of the Churchill R." The only specimen seen close to our area, however, is one from Eskimo Point, Keewatin, north of Churchill at about lat. 61° N. [*see* Porsild, Rhodora 34: 90-94. 1932; Polunin, 1940].

### 2. RUPPIA L.

### (Ditch-grass)

1. **R. maritima** L. var. **occidentalis** (Wats.) Graebn. (*R. occidentalis* Wats.)

A collection has been seen only from Pelican Lake northeast of Turtle Mountain (Lawrence, 1952). First report: the present publication; but the basis of the citation of the eastern *R. maritima* var. *longipes* by Lowe [1943] from Virden, Rock Lake northeast of Turtle Mountain, and St. Ambroise near the south end of Lake Manitoba.

Subarctic western American: Alaska to B.C., e. to Man., Minn., and Neb.; the whole species circumpolar.

### 3. POTAMOGETON L.

### (Pondweed)

[*See* St. John, 1916; Fernald, 1932; Ogden, 1943.]

1. Submersed leaves 4 mm. or more wide.
   2. Base of submersed leaves cordate or auriculate.
      3. Leaves with minutely toothed cartilaginous margins, stiffly 2-ranked, adnate to the lower half of the sheathing, coarsely fibrous, whitish stipules........4. *P. robbinsii*
      3. Leaves neither toothed nor with cartilaginous margins, free from the stipules.
         4. Stipules usually persistent and conspicuous; leaves mostly 10-25 cm. long, often boat-shaped at the uninjured tip..........................15. *P. praelongus*
         4. Stipules soon disintegrating into fibres and disappearing; leaves 1·5-10 cm. long ..........................................................16. *P. richardsonii*

2. Base of submersed leaves neither cordate nor auriculate.

5. Stem strongly wing-flattened, 1-3 mm. wide; leaves linear, not more than 5 mm. wide, with 1 or 3 strong nerves and many fine ones; peduncles 1-1·5 mm. thick...........5. *P. zosteriformis*

5. Stem nearly round in cross-section or, if flattened, slender.

6. Stipules 4-10 cm. long; submersed leaves 11-19-nerved.........14. *P. illinoensis*

6. Stipules 1-3 cm. long; submersed leaves 3-9-nerved.

7. Stems flattened but slender; submersed leaves often strongly 2-ranked, the lacunar strip paralleling their midveins 1-2 mm. wide or more (of 9-18 rows of cells)..........10. *P. epihydrus* var. *nuttallii*

7. Stems terete; submersed leaves looser, with lacunar strips 0·5 mm. wide or less (of not more than 4 rows of cells).

8. Submersed leaves mostly 8-14 cm. long, reddish-brown to olive-green, transparent; floating leaves (when present) thin and delicate, not sharply distinct from the short petiole; achenes pitted when mature..........11. *P. alpinus* var. *tenuifolius*

8. Submersed leaves mostly 3-8 cm. long, green; floating leaves firm, sharply distinct from the petiole; achenes not pitted............13. *P. gramineus*

1. Submersed leaves less than 4 mm. wide.

9. Stipules sheathing the base of the leaf, only their summits free.

10. Leaves with minutely toothed cartilaginous margins, stiffly 2-ranked, 3-8 mm. wide, auricled at base, many-nerved..........4. *P. robbinsii*

10. Leaves neither toothed nor with cartilaginous margins, 0·2-2 mm. wide, not auricled.

11. Stipular sheaths, at least of the lower primary leaves, loose and much wider than the stem; spike 3-8 cm. long, of 5-12 nearly equidistant whorls..........2. *P. vaginatus*

11. Stipular sheaths close, scarcely wider than the stem; spikes 0·5-5 cm. long, the lower whorls progressively farther apart.

12. Achenes 3·5-4 mm. long, short-beaked; leaves 0·2-1 mm. broad, sharp-pointed; stem branched from most of the nodes..........3. *P. pectinatus*

12. Achenes 2-3 mm. long, nearly beakless; stem branched chiefly at the base.

13. Spike 1·5-5 cm. long, its lower whorls 0·7-2·5 cm. apart; leaves 0·2-0·5 mm. broad, blunt..........1. *P. filiformis*

13. Spike 0·5-2·5 cm. long, the upper whorls crowded, the lower 1-7 mm. apart.

14. Leaves 0·2-0·5 mm. broad, obtuse or shallowly notched at tip..........1a. *P. filiformis* var. *borealis*

14. Leaves 0·7-2 mm. broad, obtuse or very short-pointed..........1b. *P. filiformis* var. *macounii*

9. Stipules free to base.

15. Submersed leaves reduced to the petioles only, firm, 1-2 dm. long; floating leaves leathery in texture, shining, attached to the petiole by a brownish joint about 1·5 cm. long..........12. *P. natans*

15. Submersed leaves with flat blades.

16. Floating leaves usually well developed.

17. Submersed leaves often strongly 2-ranked, the lacunar strip paralleling their midveins 1-2 mm. wide or more (of 9-18 rows of cells); petioles of floating leaves about equalling their blades; stem flattened; achenes laterally compressed..........10. *P. epihydrus* var. *nuttallii*

17. Submersed leaves looser, with lacunar strips 0·5 mm. wide or less (of 4 rows of cells or less, or apparently absent); petioles of floating leaves often exceeding their blades; stem scarcely flattened; achenes plump..........13. *P. gramineus*

16. Floating leaves absent.

18. Stem strongly wing-flattened, 1-3 mm. wide; leaves with 1 or 3 principal nerves and many (usually 25 or more) fine ones........5. *P. zosteriformis*

18. Stem slender, nearly round in cross-section; leaves 3-7-nerved, the lateral nerves often inconspicuous.

19. Leaves lacking basal glands, 3-5-nerved; spikes 2-5 mm. long, on peduncles usually less than 1 cm. long; achenes with a thin, undulate or dentate, dorsal keel..........6. *P. foliosus*

19. Leaves usually with a pair of translucent basal glands; spikes 5-15 mm. long, on peduncles 1-9 cm. long; achenes rounded on back.
    20. Leaves 5(-7)-nerved, obtuse or rounded at the minutely cuspidate tip; peduncles 1·5-5 cm. long, slightly flattened and broadened upward . . . . . . . . . . 7. *P. friesii*
    20. Leaves 3-nerved, acute to obtuse; peduncles 1-9 cm. long.
        21. Peduncles filiform . . . . . . . . . . 9. *P. pusillus*
        21. Peduncles upwardly broadened. . 8. *P. strictifolius* var. *rutiloides*

1. **P. filiformis** Pers. (*P. interior* Rydb.)

At the present time known definitely only from Churchill, where it was first collected by J. M. Macoun in 1910 [*see* St. John, 1916; Polunin, 1940]. First report: Churchill [St. John, 1916]. Basis of the listing of *P. marinus* L. by Burman [1910].

Subarctic circumpolar: Alaska to Nfld., s. to Nev., N.D., and Vt.; southern half of Greenland; Iceland; Eurasia.

1a. **P. filiformis** var. **borealis** (Raf.) St. John

More common, probably including most or all of the citations of *P. interior* by Lowe [1920, 1943]. Northernmost collection seen: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Warren Landing (Lowe, 1918). First report: Churchill [Radforth, 1950].

(Arctic-)subarctic American: n. coast of Alaska and Mack. to n. Keewatin, s. Baffin I., central Lab., and Nfld., s. to Utah, Colo., Minn., and Pa.; se. Asia.

1b. **P. filiformis** var. **macounii** Morong

The only specimen seen is one from Forrest, near Brandon, collected in 1906 by Macoun and Herriot, although a map of Fernald [1925, map 27] shows a dot for the variety in the neighbourhood of Gunisao Lake off the northeast coast of Lake Winnipeg. The Forrest specimen, in the National Herbarium of Canada, was identified by St. John, but not cited in his 1916 paper. First report: Fernald [1925, map 27, p. 259].

(Subarctic-)temperate amphi-Atlantic: n. Alta. to s. James Bay and the Magdalen Islands, s. to Calif., Colo., S.D., Wisc., and P.E.I.; Sweden.

2. **P. vaginatus** Turcz. (*P. moniliformis* St. John, Rhod. 18: 130. 1916)

Ponds and streams of southern and central Manitoba. Northernmost collection: Churchill (Porsild, 1930). Earliest collection seen: "Lac Winipeg" (Bourgeau, 1859). First report: St. John [1916; the foregoing Bourgeau collection].

(Arctic-)subarctic circumpolar: n. coast of Alaska and Mack. to n. Que. and Nfld., s. to Oreg., N.D., Mich. and N.J.; Eurasia.

3. **P. pectinatus** L. (*P. interruptus* Kit.)

Ponds and streams of southern and central Manitoba. Northernmost collection: The Pas (Krivda, 1951). Earliest collection seen: Lake Winnipeg (Lowe, 1916). First report: near York Factory ["H", Richardson, in Franklin, 1823].

Subarctic circumpolar: central Alaska and n. Mack. to James Bay and Nfld., s. to Tex., Mex., and Fla.; Eurasia.

4. **P. robbinsii** Oakes

Specimens have been seen from the following localities: Bissett, 20 miles from the Ontario boundary at about lat. 51° N. (B. J. Marck, 1936); MacBride Lake, lat. 56° 52′ N., long. 99° 57′ W., bottom at 1 m. in silty mud (J. C. Ritchie, 1955). First report: MacBride Lake [Ritchie, 1956a].

(Subarctic-)temperate American: B.C. to north-central Man. and N.B., s. to Oreg., Wyo., Minn., Ill., Ala., and Del.

5. **P. zosteriformis** Fern. (P. *zosterifolius* and *P. compressus* of Am. auth.)

Ponds and streams of southern and central Manitoba. Northernmost collection: Drunken Lake, about 50 miles north of Lake Winnipeg (Scoggan, 1948). Earliest collection seen: Lake Manitoba, south end (1908; name of collector not given). First report: York Factory [Hooker, 1839]. Verification of this northern citation must await further collecting.

Subarctic American: central Alaska and Mack. R. Delta to n. Alta., s. James Bay, and e. Que., s. to n. Calif., Mont., Neb., Ind., and Va. Closely related to the Eurasian *P. zosterifolius* Schum. A map of the area (incomplete in the north) is given by Fernald [1932, map 2].

6. **P. foliosus** Raf.

Ponds and streams of southwestern Manitoba. The following are the only specimens seen: Rapid City, 20 miles north of Brandon (Macoun, 1896); Killarney, northeast of Turtle Mountain (Macoun, 1896); Aweme, 15 miles southeast of Brandon (Criddle, 1939). First report: citation of the foregoing Macoun collections by Fernald [1932].

Temperate American: Wash. to s. Man. and n. N.Y., s. to Calif., Mex., and Ga.; farther to the north, var. *macellus* Fern. A map of the area is given by Fernald [1932, map 4].

7. **P. friesii** Rupr.

Widely distributed in ponds and rivers throughout the province. Northernmost collection: Reindeer Lake, lat. 57° 37′ N. (Baldwin, 1951). Earliest collection seen: York Factory (Drummond; specimen in Gray Herbarium of Harvard University undated, but presumably collected during Franklin's expeditions of 1819–22). First report: citation of the foregoing Drummond collection by Fernald [1932].

Subarctic American: sw. Alaska and Mack. R. Delta to s. Keewatin, James Bay, and Nfld., s. to s. B.C., s. Alta., S.D., Ind., and Va. A map of the distribution (incomplete in the north) is given by Fernald [1932, map 7].

8. **P. strictifolius** Benn. var. **rutiloides** Fern. (*P. rutilus* of Am. auth., not Wolfg.)

Only four specimens have been seen, all collected on the Nelson-Hayes system between Lake Winnipeg and Hudson Bay. Northernmost collection: York Factory (Drummond, undated; Scoggan, 1949). Earliest collection seen: York Factory (Drummond; specimen in Gray Herbarium undated, but presumably collected during Franklin's expeditions of 1819–22). First report: citation of the foregoing Drummond collection by Fernald [1932].

Subarctic American: Mack. R. Delta and Great Bear L. to n. Man. and s. Que., s. to Utah, Neb., Minn., Ind., and N.Y. A map of the area (incomplete in the north) is given by Fernald [1932].

9. **P. pusillus** L. (Incl. var. *minor* (Biv.) Fern. & Schub.; *P. panormitanus* Biv.)

Ponds and streams throughout southern and central Manitoba. Northernmost collection: Cross Lake, northeast of Lake Winnipeg (Scoggan, 1948). Earliest collection seen: "Little Saskatchewan River", pools, ditches, and streams (Macoun, 1872). As indicated by Macoun (1888), this locality is near Rapid City, 20 miles north of Brandon, on what is now known as the Minnedosa River, but is called on old maps the Little Saskatchewan or Rapid River. The present-day Little Saskatchewan is the final short stretch of the Saskatchewan River emptying into Lake Winnipeg at Grand Rapids. First report: York Factory [Hooker, 1839]. Verification of this northern citation must await further collecting.

Subarctic circumpolar: central Alaska and Yukon to central Man. and e. Que., s. to Mex., Tex., La., Ala., and Va.; Iceland; Eurasia. Maps of the American areas (incomplete in the north) of *P. panormitanus* var. *major* and var. *minor* are given by Fernald [1932, maps 10 and 11].

*P. berchtoldi* Fieber var. *lacunatus* (Hagstr.) Fern., with margins of stipules free rather than connate as in *P. pusillus*, is cited by Fernald [1932; *P. pusillus* var. *lacunatus*] from Muskeg Creek, Lake Winnipeg (but is not indicated on the accompanying map 20). As pointed out by Gleason [1952], "While free stipules or united ones may be characteristic of some species, there is little reason to infer that both types or gradations between them may not occur within a single species". Decision as to the inclusion of this species as a definite entity in our flora, as distinct from P. *pusillus*, may well await further study [*see* Dandy & Taylor, Jour. Bot. 76: 90-92. 1938; Fernald, Rhodora 42: 246. 1940].

*P. spirillus* Tuck. (*P. diversifolius* Bart., not Raf.) is cited by Hooker [1839] from "Norway House Fort to Canada", forming the probable basis for the inclusion of Manitoba in the range of this species by Fernald [1950]. Lack of the specimen involved and the considerable distance from the main area [*see* Fernald, 1932, map 26] necessitate the exclusion of this species from our flora.

10. **P. epihydrus** Raf. var. **nuttallii** (C. & S.) Fern.

Specimens have been seen only from Falcon Lake (Lowe, 1921) and Brereton Lake (Simpson, 1941) in the Whiteshell Forest Reserve of southeastern Manitoba. A Richardson collection in 1827 is reported by Fernald [1932] from "Lake Winnipeg at confluence of Red River". Basis of reports of the main form from the province.

(Subarctic-)temperate amphi-Atlantic: southernmost Alaska to Calif. and Colo.; s. Man. to s. Lab. and Nfld., s. to Tenn., Ga., and Va.; nw. Europe. A map of the area is given by Fernald [1932, map 31].

11. **P. alpinus** Balbis var. **tenuifolius** (Raf.) Ogden (*P. microstachys* Wolfg.; *P. rufescens* of Am. auth., in large part, not Schrad.)

Lakes and rivers of central and northern Manitoba. Northernmost collection: Churchill (several collections, the first by Porsild in 1930). Earliest collection seen: the foregoing Churchill specimen. First report: Churchill [Ogden, 1943]. This is the plant cited by Jackson *et al.* from Nelson River as *P. alpinus*, presumably on the basis of the report of Macoun [1888] of a collection there by Bell of *P. rufescens*. The citation of Bell [1880] reads "Nelson River between Lake Winnipeg and the coast of Hudson's Bay". The plant reported by Bell [1880] as *P. lucens*, from "Nelson River between Lake Winnipeg and the coast of Hudson's Bay", probably belongs here, although the specimen has not been seen.

(Arctic-)subarctic American: n. Alaska and nw. Mack. to central Keewatin, n. Que., and Nfld., s. to Calif., Colo., Minn., and Pa.; sw. Greenland; e. Asia. A map of the American area is given by Ogden [1943, map 2].

*P. amplifolius* Tuck. is included by Burman [1910] in his checklist, and cited by Lowe [1943] from Lake Winnipeg, Lake Manitoba, and Brereton Lake. No Manitoba specimens appear to be extant, however, although Odgen [1943] cites a collection from Antler Creek just south of the border of western Manitoba. Careful search should be made for this species.

12. **P. natans** L.

Ponds and streams of southern and central Manitoba. Northernmost collection: Manistikwan Lake, near Flin Flon (Freedman, 1950). Earliest collection seen: Sandilands and Whitemouth River (Dudley, 1930) (a specimen collected by Macoun in 1883 on the "Souris Plain" may have been in the Manitoba section). First report: Lake of the Woods [Dawson, 1875].

(Subarctic-)temperate circumpolar: se. Alaska to central Man. and Nfld., s. to Calif., N.M., Neb., and Pa.; s. Greenland; Iceland; Eurasia. A map of the American area (incomplete in the north) is given by Ogden [1943, fig. 8].

13. **P. gramineus** L. (*P. heterophyllus* of most auth., not Schreb.)

Ponds, streams, and rivers throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 43′ N. (Baldwin, 1951). Earliest collection seen: Killarney, about 50 miles south of Brandon, ditch (Macoun, 1896). First report: Burman [1910; as *P. gramineus* var. *heterophyllus*]. Some of the Manitoba specimens may belong to var. *maximus* Morong or var. *myriophyllus* Robbins.

Subarctic circumpolar: nw. coast of Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, and Nfld., s. to Calif., N.M., Neb., Ind., and N.J.; s. Greenland; Iceland; Eurasia. A map of the American area (incomplete in the north) is given by Ogden [1943, map 10].

A hybrid of *P. gramineus* with some other species, possibly *P. alpinus* var. *tenuifolius*, is cited by Ogden from Churchill. The specimen is in the National Herbarium of Canada (Polunin, 1936).

14. **P. illinoensis** Morong

This species is cited from Souris, about 20 miles southwest of Brandon, by Ogden [1943], where it was collected by Macoun in 1883. A collection from Bissett, about lat. 51° N. near the Ontario boundary (Marck, 1936) also appears to belong here. The specimen is in the herbarium of the Division of Botany and Plant Pathology, Dept. of Agric., Ottawa. First report: Souris [Ogden, 1943].

Temperate American: s. B.C. to s. Man. and s. Que., s. to Calif., Fla., and Tex. A map of the area is given by Ogden [1943, map 13].

15. **P. praelongus** Wulfen

Ponds, streams, and rivers of southern and central Manitoba. Northernmost collection: Hayes River between Knee Lake and Swampy Lake, about 140 miles from York Factory (Scoggan, 1949). Earliest collection seen: Warren Landing (Lowe, 1918). First report: Lowe [1943].

Subarctic circumpolar: sw. Alaska and n. Mack. to Great Slave L., s. Keewatin, James Bay, and Nfld., s. to Calif., Colo., Ia., and N.J.; Eurasia. A map of the American area (incomplete in the north) is given by Ogden [1943, map 14], to which should be added dots representing the occurrence of the species in Manitoba.

16. **P. richardsonii** (Benn.) Rydb. (*P. perfoliatus* ssp. *richardsonii* (Benn.) Hult.)

Ponds, streams, and rivers throughout the province. Northernmost collection: Cochrane River, lat. 58° 54′ N. (Baldwin, 1951). Earliest collection seen: Brandon, pool (Macoun, 1876). First report: Warren Landing [Lowe, 1920]. This is, undoubtedly, the plant cited by Bell [1880] as *P. perfoliatus* from "Nelson River between Lake Winnipeg and the coast of Hudson's Bay".

Subarctic American: nw. coast of Alaska, Mack. R. Delta, and Great Bear L. to James Bay and interior Lab., s. to Calif., Neb., and Pa. Maps of the area are given by Ogden [1943, map 15] and Löve [Svensk Botanisk Tidskrift 48: 217 (fig. 2). 1954].

## 13. NAJADACEAE

(Naiad Family)

### 1. NAJAS L.

(Naiad)

1. **N. flexilis** (Willd.) Rostk. & Schmidt

The only specimens seen are from Bissett, near the Ontario boundary at about lat. 51° N. (Marck, 1936), and Jessica Lake in the Whiteshell Forest Reserve of southeastern Manitoba (Hinks, 1939), both in the herbarium of the Division of Botany and Plant Pathology, Dept. of Agric., Ottawa. The first report for the province appears to be either that of Lowe [1943; "In a number of lagoons on L. Winnipeg, between the Red R. and Victoria Beach."] or the undated 21st Anniversary Bulletin (1920 to 1941) of the Natural History Society of Manitoba, in which the species is recorded from Victoria Beach. A map given by Fernald [1929, map 38], however, apparently includes the southeastern corner of the province in the range.

(Subarctic-)temperate amphi-Atlantic: B.C. and n. Alta. to Oreg.; se. Man. and Minn. to L. Mistassini, Que., and Nfld., s. to Ia. and Va.; nw. Europe.

## 14. JUNCAGINACEAE

(Arrow-grass Family)

1. Leaves basal, closed at tip; flowers numerous, greenish, in a long bractless spike-like raceme; carpels 3-6, united until maturity . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *Triglochin*
1. Leaves borne along the stem, each with a terminal pore; flowers few, white, in a loose raceme, each subtended by a bract; carpels 3, only slightly united at base. . 2. *Scheuchzeria*

### 1. Triglochin L.

(Arrow-grass)

1. Fruit oblong or ovoid, mostly 3-6 mm. long, rounded at base, the carpels usually 6, each with a recurving beak . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *T. maritima*
1. Fruit linear, club-shaped, mostly 7-8 mm. long, blunt and beakless, the 3 carpels when mature separating from below upward, their awl-pointed bases spreading . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *T. palustris*

1. **T. maritima** L.

Wet, often alkaline, soils throughout the province, and salt marshes of the Hudson Bay shore. Northernmost collection: Churchill (several collections, the earliest by Porsild in 1930). Earliest collection seen: York Factory (McTavish, 1854). First report: near York Factory ["H", Richardson, in Franklin, 1823].

(Arctic-)subarctic circumpolar: central Alaska and n. coast of Mack. to James Bay, n. Que., n. Lab., and Nfld., s. to Ariz., n. Mex., N.D., and Pa.; Iceland; Eurasia; n. Afr.; Patagonia.

2. **T. palustris** L.

Wet, often alkaline, soils throughout the province, and salt marshes of the Hudson Bay shore. Northernmost collection: Mosquito Point, 7 miles north of Churchill (Porsild, 1930). Earliest collection seen: Brandon, marsh (Macoun, 1896). First report: Hayes River [Bell, 1881].

(Arctic-)subarctic circumpolar: coasts of Alaska and Mack. to n. Lab. and Nfld., s. to Calif., N.M., Neb., and Pa.; southern half of Greenland; Iceland; Eurasia.

### 2. Scheuchzeria L.

1. **S. palustris** L. var. **americana** Fern.

Only one specimen has been seen from the province: Reindeer Lake, lat. 57° 52′ N., marsh around landlocked lake (Baldwin, 1951). An early Richardson collection, however, is cited by Hooker [1839] from "between Cumberland House Fort (Sask.) and Hudson's Bay".

(Subarctic-)temperate American: southernmost Alaska to n. Alta., n. Man., and Nfld., s. to Calif., N.M., Neb., and N.J.; the whole species circumpolar.

## 15. ALISMATACEAE

### (Water-plantain Family)

1. Flowers numerous, small, the whorls of 3-10 in a compound panicle; flattened carpels arranged in a single ring on the small flat receptacle; stamens 6; leaves tapering to rounded or subcordate at base........................................1. *Alisma*

1. Flowers fewer, larger, in whorls of 3 along a usually simple axis; flattened carpels in a dense head on a globular receptacle; stamens very numerous, mostly absent from the lower flowers; leaves tapering to base or sagittate......................2. *Sagittaria*

### 1. Alisma L.

### (Water-plantain)

1. Leaves submersed and ribbon-like, or emersed and firm, the blades of these lanceolate to narrowly elliptic, tapering at base; petals 2-4 mm. long; stamens barely equalling the ovaries, their rounded anthers barely 0·5 mm. long..................1. *A gramineum*

1. Leaves essentially all emersed, less firm, their blades ovate to elliptic, rounded to subcordate at base; petals 3·5-6 mm. long; stamens twice as long as the ovaries, their ovoid anthers 0·6-0·8 mm. long..........................................2. *A. triviale*

1. **A. gramineum** Gmel. (*A. geyeri* Torr.)

Only two specimens have been seen: Pruden Bay, at the mouth of Red River (Lowe, 1940); Brandon, shallow water (Stevenson, 1953). It is also reported by Jackson *et al.* [1922] from Sturgeon Creek, near Winnipeg, and by Lowe [1943] from Rossburn. The plant is considered by Gleason [1952] to fall within the acceptable limits of variation of the following species.

Temperate circumpolar: Alta. and Wash. to Wisc., s. to Oreg., Nev., Utah, and S.D.; sw. Que. and n. N.Y.; Eurasia; n. Afr.

2. **A. triviale** Pursh (*A. plantago-aquatica* of Am. auth., not L.; *A. brevipes* Greene)

Shallow water and muddy habitats of southern and central Manitoba. Northernmost collection: Cranberry Portage, 20 miles southeast of Flin Flon (Freedman, 1950). Earliest collection seen: Turtle Mountain, shallow water (Burgess, 1873). First report: Jackson *et al.* [1922; as *A. brevipes*]. Gleason [1952], however, considers the American plant to be identical with the European *A. plantago-aquatica,* and as such it was reported by Dawson [1875] from Turtle Mountain and the Winnipeg district.

Temperate American: B.C. to Que., s. to Ariz., Mex., and Fla.

*A. subcordatum* Raf., differing from the foregoing in its smaller floral dimensions, has been reported from the province, but further study is necessary to establish it as a distinct entity in our flora.

## 2. SAGITTARIA L.

## (Arrowhead)

1. Leaves linear to oval, tapering to an unlobed base; flowering scapes flexuous, usually bent near the lowest whorl, shorter than the leaves; lower (pistillate) flowers sessile to subsessile, the upper (staminate) ones on long pedicels; filaments of stamens more or less glandular-pubescent; beak of achenes 1-1·5 mm. long, erect or arching; head of achenes with a strongly prickly appearance........................................1. *S. rigida*

1. Leaves linear to ovate, sagittate, the basal lobes linear to triangular-ovate; flowering scapes straight; flowers all slender-pedicelled; filaments glabrous; head of achenes not strongly prickly.

  2. Fruiting heads 0·8-1·3 cm. in diameter; bracts acute to attenuate; achenes 2-2·6 mm. long, the erect or suberect beak borne well in from the margin, 0·2-0·4 mm. long, terminating the strongly rounded inner keel...............2. *S. cuneata*

  2. Fruiting heads 1-3 cm. in diameter; bracts acute to obtuse; achenes 2·3-3·5 mm. long, with broad marginal wings, the subhorizontal to slightly incurved broad-based marginal beak 1-2 mm. long.

    3. Later leaf-blades acute, or, if obtuse, strongly narrowed from base to apex, the basal lobes arching or divergent; achenes rounded at summit.............3. *S. latifolia*

    3. Later (or all) leaf-blades obtuse or rounded at summit, the terminal lobe about as broad as long, the broad subacute to obtuse basal lobes parallel or only slightly divergent; achenes subtruncate at summit.............3a. *S. latifolia* var. *obtusa*

1. **S. rigida** Pursh

Three specimens have been seen, all from shallow water habitats of southeastern Manitoba: Shoal Lake (Lowe, 1920); Indian Bay (Scott, 1925); Caddy Lake (Rook, 1950). First report: Waugh, on Indian Bay, a northwestern extension of Lake of the Woods [Lowe, 1943].

Temperate eastern American: se. Man. to sw. Que., s. to Neb., Mo., Tenn., and Va.

2. **S. cuneata** Sheldon (*S. arifolia* Nutt.)

Shallow water throughout the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 54′ N. (Baldwin, 1951). Earliest collection seen: Hamiota, about 35 miles northwest of Brandon, (Macoun & Herriot, 1906). First report: Winnipeg Valley [Smith, 1894].

(Subarctic-)temperate American: s. Alaska and s. Yukon to s. James Bay and e. Que., s. to Calif., N.M., Ia., and N.Y.

3. **S. latifolia** Willd.

Shallow water throughout the southern half of the province. Northernmost collection: Schist Lake, near Flin Flon (Freedman, 1952). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Muskeg Island, Lake Winnipeg [J. M. Macoun, 1895].

Temperate American: s. B.C. to Que., s. to Kans., Ia., and S.C.

Forma *hastata* (Pursh) Robins., with body of leaf only two-fifths to one-seventh as broad as long, is common throughout the Manitoba area.

Forma *gracilis* (Pursh) Robins., with body of leaf only one-eighth to one-sixteenth as broad as long, has been collected at Victoria Beach (Higham, 1922) and Middleboro (A. & D. Löve, 1953), and is probably of general distribution. Probable basis of the tentative report of *S. engelmanniana* from the province by Lowe [1943].

3a. **S. latifolia** var. **obtusa** (Muhl.) Wieg.

A specimen has been seen from Morden (Marshall, 1941), and further collections will undoubtedly reveal a considerable Manitoba area. First report: the present publication.

About the range of the main form.

## 16. HYDROCHARITACEAE

(Frog's-bit Family)

1. Stem elongate, with very numerous ovate-lanceolate to oblong sessile leaves, these 1-ribbed, veinless, transparent, the median and upper ones in whorls of 3's, crowded and strongly overlapping toward summits of branches, 6-13 mm. long............1. *Elodea*
1. Stem very short, the leaves thin and ribbon-like, up to 2 m. or more long, 0·5-2 cm. broad, net-veined..........................................2. *Vallisneria*

### 1. ELODEA Michx.

(Waterweed)

1. **E. canadensis** Michx. (*E. planchonii* Casp.; *Anacharis canadensis* (Michx.) Planch.; *see* discussion in Taxon 3: 15-16. 1954)

Quiet, shallow waters throughout the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 54′ N. (Baldwin, 1951). Earliest collection seen: Souris River, stagnant water (Macoun, 1883). First report: Burman [1910].

(Subarctic-)temperate American: Wash., Sask., and n. Man. to James Bay and Ungava, s. to Calif., Colo., Okla., Ia., Ala., and N.C.

### 2. VALLISNERIA L.

(Tapegrass)

1. **V. americana** Michx. (*V. spiralis* of Am. auth., not L.)

Streams, rivers, and lakes of southern Manitoba. Northernmost collection: Elphinstone, 50 miles northwest of Brandon, water of Minnedosa River (Scoggan, 1951) (but reported by Lowe as far north as Steeprock on Portage Bay, Lake Manitoba). First report: Indian Bay, Waugh, and Steeprock [Lowe, 1943]. Basis of reports of *V. spiralis* L. from the province.

Temperate eastern American: s. Man. to s. N.B., s. to Tex. and Fla. A map of the area (apparently not including s. Man.) is given by Fernald [1929, map 1].

# 17. GRAMINEAE

## (Grass Family)

[*See* Hitchcock, 1951; Fassett, 1951.]

1. Spikelets more or less dorsally compressed, with a single fertile floret, this sometimes with a staminate or rudimentary floret borne below it; rachilla (floral axis) jointed below the glumes, the whole spikelet, including glumes, dropping in fruit (Subfamily *PANICOIDEAE*).
  2. Florets with long slender bent awns 0·8-2 cm. long (except *Andropogon hallii*, with linear spikelets in digitate racemes, whose awns are obsolete or up to 6 mm. long and straight); fertile lemma thin and transparent, merely a basal appendage to the bent awn; glumes subequal, indurated; spikelets with long silky hairs; tall stout perennials, chiefly of dry or sandy prairie....................Tribe 9. ANDROPOGONEAE
  2. Florets awnless (or sometimes awned in *Echinochloa*, with ovoid spikelets crowded in stout, 1-sided, panicled racemes); fertile lemma indurated, firmly clasping the palea and covering the free grain; glumes unequal, the 1st (lower) much smaller than the 2nd, or obsolete; spikelets without long silky hairs; annuals (except some species of *Panicum*), chiefly of dry roadsides and waste ground.........Tribe 10. PANICEAE

1. Spikelets usually more or less laterally compressed (dorsally compressed in *Milium*, with 1-flowered spikelets 3-3·5 mm. long in a loose panicle with widely spreading or drooping slender branches); fertile florets 1-many, the imperfect or rudimentary floret, if present, usually borne at summit of spikelet; rachilla usually jointed above the glumes, these persisting as husks, or, if jointed below the glumes, these laterally compressed (Subfamily *FESTUCOIDEAE*).
  3. Spikelets borne in a 2-rowed spike (rarely in subcapitate clusters).
    4. Spikelets on opposite sides of the rachis; spike solitary, elongate..........................................................Tribe 2. HORDEAE
    4. Spikelets on one side of rachis, the spike therefore 1-sided; spikes elongate or capitate, solitary or in terminal racemes or panicles.............Tribe 5. CHLORIDEAE
  3. Spikelets in open or spike-like panicles.
    5. Spikelets with 2-many perfect florets (except *Catabrosa*, with usually 1-flowered spikelets).
      6. Glumes shorter than the lowest floret (except *Dupontia*, of Hudson Bay salt marshes); lemma awnless or awned at or near the tip or between the terminal teeth..................................Tribe 1. FESTUCEAE
      6. Glumes usually equalling or surpassing the lowest floret or all of them; awn of lemma, when present, dorsal...............................Tribe 3. AVENEAE

so
Festuca
scabrella

    5. Spikelets with 1 perfect floret (No. 12, *Catabrosa*, may be sought here).
      7. Spikelets unisexual, the pistillate linear, awned, on thick clavate pedicels on the appressed upper branches of the panicle, the staminate lanceolate, on capillary pedicels on the expanded lower branches of the same panicle, early deciduous; glumes obsolete; grain cylindric, 1-2 cm. long, blackish...Tribe 8. ZIZANIEAE
      7. Spikelets bisexual, all alike.
        8. Spikelets strongly flattened, oblong, 4-6 mm. long, without glumes; lemma boat-shaped, somewhat indurated, awnless, strongly bristly-ciliate on the keel; panicle diffusely branched; leaves strongly scabrous on margins.......................................................Tribe 7. ORYZEAE
        8. Spikelets compressed but not flat; glumes present.
          9. Spikelet with 2 scale-like or normal sterile lemmas below and falling with the fertile floret (the spikelets 3-flowered but the 2 lower florets rudimentary or staminate); palea of fertile floret 1-nerved....Tribe 6. PHALARIDEAE
          9. Spikelet with no sterile lemma below the fertile floret; palea 1- or 2-nerved..............................................Tribe 4. AGROSTIDEAE

### Tribe 1. FESTUCEAE Nees

1. Glumes exceeding the uppermost floret; lemma with a tuft of hairs at base; spikelets shining, usually 2-flowered; panicle narrow, its branches erect or strongly ascending; leaf-sheaths overlapping; stem glabrous, stoloniferous at base; plant of Hudson Bay salt marshes.....................................................................9. *Dupontia*

1. Glumes shorter than the lowest floret.
   2. Rachilla clothed with long silky hairs which at maturity exceed the lemmas; inflorescence a large plume-like panicle; leaf-blades 1-6 cm. wide; culms stout and reed-like, 1·5-4 m. high or more........................................14. *Phragmites*
   2. Rachilla naked or short-pilose; leaf-blades relatively narrow; plants not reed-like.
      3. Spikelets subsessile in dense 1-sided clusters at the ends of the stiff, naked branches of the 1-sided panicles, these contracted after flowering; plant coarse, glaucous, scabrous, 0·4-1·5 m. high....................................10. *Dactylis*
      3. Spikelets not in 1-sided clusters; panicle with branches spirally arranged.
         4. Lemmas 3-nerved.
            5. Glumes and lemmas keeled.
               6. Spikelets 10-40-flowered; glumes and lemmas thin and dry, translucent, only the prominent broad nerves green; lemmas not cobwebby at base; grain free from palea, not furrowed; annuals of gravelly and sandy shores or dry waste places..........................................11. *Eragrostis*
               6. Spikelets 2-5(-7)-flowered; glumes and lemmas herbaceous, only the margins thin and translucent; lemmas usually cobwebby at base; grain closely embraced, furrowed; plants perennial (except *P. annua*)............7. *Poa*
            5. Glumes and lemmas rounded on back, not keeled, the lemmas 2-3 mm. long, truncate and erose at tip, strongly 3-nerved; spikelets yellowish-brown to purplish, mostly 1-flowered (rarely 2), in a narrow panicle; culms soft, decumbent and rooting at lower nodes, coarsely furrowed; leaves 2-9 mm. broad, callous-tipped, their loose sheaths overlapping.................12. *Catabrosa*
         4. Lemmas 5-11-nerved (or only obscurely nerved in *Arctophila*).
            7. Lemmas keeled, awnless, acute or subacute (obtuse in *Poa compressa*).
               8. Plants with perfect florets in each spikelet, these 2-several-flowered; lemmas 5-nerved, herbaceous or membranaceous, mostly scarious-tipped, the nerves often pubescent or cobwebby at base...........................7. *Poa*
               8. Plants dioecious; spikelets 7-9-flowered or more, crowded in small panicles; lemmas 9-11-nerved, rigid and coriaceous, smooth; leaves involute to flat, stiffish, usually strongly serrulate on margins and sharp tips; plant of saline or alkaline soils, with creeping rhizomes covered with papery, whitish scales ......................................................13. *Distichlis*
            7. Lemmas rounded on the back or keeled only near tip.
               9. Lemma only obscurely nerved, obtuse, glabrous, about 4 mm. long; spikelets 3-6-flowered; panicle loose, its rays drooping; stout smooth plant of wet shores of Hudson Bay.................................8. *Arctophila*
               9. Lemmas distinctly nerved.
                  10. Lemmas definitely 2-lobed at apex, often awned from the notch or just below it.
                      11. Grain pubescent at summit; stigmas sessile, plumose, borne laterally from below summit of ovary; lemma 5-9-nerved; callus at base of lemma not fringed with hairs; ligule not sheathing the culm.........................................................1. *Bromus*
                      11. Grain glabrous; styles terminal; lemma 7-nerved; callus with a ring of short stiff hairs; ligule encircling the culm and continuous with the front of the sheath; spikelets bronze to purplish.......2. *Schizachne*
                  10. Lemmas not 2-lobed, the awn, when present, terminal.
                      12. Lemma somewhat toothed at apex, 7-nerved, 1 or more lateral nerves excurrent as sharp points; callus and ovary hairy; culms stout, 1-2 m. high; plant of marshes and shallow water..........6. *Scolochloa*
                      12. Lemmas entire or erose, the nerves not excurrent; callus and ovary glabrous.
                          13. Lateral nerves of the 5-nerved lemma arched and converging to the midrib; terminal awn often present; plants usually of dry soil and rocky slopes..................................3. *Festuca*

13. Lateral nerves of lemma parallel, nearly straight, not arching to midrib; lemma awnless; plants of wet or moist habitats.
14. Nerves of lemma faint, generally 5; stigmas sessile; leaf-sheaths open; plants of saline habitats.........4. *Puccinellia*
14. Nerves of lemma mostly prominent, generally 7; styles definite; leaf-sheaths closed; plants of fresh habitats.................5. *Glyceria*

### Tribe 2. HORDEAE Lindl.

1. Spikelets solitary at each joint of the rachis, 3-many-flowered; lemmas 5-7-nerved, awnless or awned from the apex.
2. Spikelets with broad side toward the rachis, both glumes normally developed.................15. *Agropyron*
2. Spikelets with narrow side toward rachis and resting in a concavity of it, the glume on that side wanting, only the terminal spikelet with both glumes........16. *Lolium*
1. Spikelets 2 or 3 at each joint of the rachis, with narrow side toward it, 1-6-flowered; lemmas obscurely 5-nerved, awnless or awned from the apex.
3. Spikelets 1-flowered, in 3's at each joint of the flattened and disarticulating rachis, the lateral pair each reduced to 1-3 spreading scabrous awns 4-8 cm. long; glumes prolonged and bristle-like; spike nodding, pale green to purple..................17. *Hordeum*
3. Spikelets 2-6-flowered, in 2's at each joint of the continuous rachis, all with perfect florets, awned or awnless; glumes, if prolonged, not bristle-like; spike erect or but slightly nodding..................18. *Elymus*

### Tribe 3. AVENEAE Nees

1. Lemmas awnless or rarely very short-awned.
2. Glumes unequal in length, acute, scabrous, persisting on the rachilla after fall of florets, the first 1-nerved, the second 3-5-nerved; lemmas faintly 3-5-nerved, acute or mucronate, whitish, lustrous, keeled; panicle spike-like..................19. *Koeleria*
2. Glumes about equal in length, deciduous with florets, the first linear, the second obovate or broadly oblanceolate, 3-nerved; lemmas obscurely nerved, rounded..................20. *Sphenopholis*
1. Lemmas distinctly awned.
3. Articulation below the glumes, the spikelets falling entire; lemmas 5-nerved, 2-toothed at tapering apex, bearing a bent awn (4-5 mm. long) about one-third the distance below apex; panicle spike-like..................21. *Trisetum*
3. Articulation above the glumes, these persisting as empty husks.
4. Awn borne from notch between apical teeth of lemma, flattened and twisted; glumes usually exceeding the uppermost floret; inflorescence a few-forked panicle, its stiff, ascending to erect branches usually with only a single, terminal spikelet; tufts of hairs present at top of leaf-sheath..................25. *Danthonia*
4. Awn definitely dorsal, not flattened; inflorescence an open or spike-like panicle of many spikelets; no tuft of hairs at top of sheath.
5. Lemmas erose-truncate, 4-nerved, the awn from near or below middle; spikelets 2-7 mm. long, usually 2-flowered..................24. *Deschampsia*
5. Lemmas acute, 5-9-nerved.
6. Spikelets ascending, subsessile in spike-like panicles; glumes 1-3-nerved, rarely equalling column of florets; lemmas keeled, their awns borne from well above the middle..................21. *Trisetum*
6. Spikelets drooping or, if ascending, distinctly pedicelled; glumes 3-9-nerved, usually exceeding the upper floret; lemmas rounded on back, awned from near or below middle.
7. Glumes about 1 cm. long, 3-5-nerved; lemmas about 1 cm. long, firm but not thick, brown; branches of the narrow panicle erect or ascending, bearing a single, 3-6-flowered spikelet; prairie perennial..........23. *Helictotrichon*
7. Glumes about 2·5 cm. long, 7-9-nerved; lemmas about 2 cm. long, indurate except toward summit; spikelets with 2 or 3 flowers, several on each drooping primary ray of the panicle; annual plants..................22. *Avena*

## Tribe 4. AGROSTIDEAE Kunth

1. Lemma indurated, thicker and much harder than the glumes.

  2. Spikelets dorsally compressed, 3-3·5 mm. long, on slender pedicles, the obtuse glumes and shining, awnless lemma rounded on back; floret falling with glumes attached; grain free; branches of the elongate-ovoid panicle with widely spreading or drooping branches.......*Milium*

  2. Spikelets almost round in cross-section, the acute or obtuse glumes and awned lemma folded or keeled; lemma firmly enclosing palea and grain; rachilla jointed above the glumes, these persisting as empty husks.

    3. Florets plump, with a short oblique callus at base; glumes ovate or oblong, obtuse to sharp-pointed; awn of lemma weak and deciduous.......26. *Oryzopsis*

    3. Florets slender, with callus prolonged into a slender stipe; glumes narrow, acute to bristle-tipped; awn firm and persistent.

      4. Awn of lemma simple.......27. *Stipa*

      4. Awn 3-forked.......28. *Aristida*

1. Lemma as thin as or thinner than the glumes; spikelets laterally compressed or almost round in cross-section; grain free from lemma.

  5. Floret raised on a short slender stipe above the glumes, these falling with it; stamen 1, its anther 0·5-0·8 mm. long; palea 1-nerved, or 2-nerved with the nerves close together; glumes narrow, minutely hispid on the keel, the first nearly equalling the short-awned lemma; panicle large and loose, its slender branches mostly spreading or drooping.......29. *Cinna*

  5. Floret not on a slender stipe; stamens mostly 3; palea 2-3-nerved or obsolete; lemma awned or awnless.

    6. Lemma awned at tip or short-pointed, tightly embracing grain; rachilla articulated above the glumes, these persisting as empty husks; plants often with short or elongate, scaly rhizomes.......30. *Muhlenbergia*

    6. Lemma awnless or dorsally awned, loosely embracing the grain.

      7. Glumes prominently keeled and folded; inflorescence a very dense, spike-like panicle.

        8. Glumes awnless, falling with floret; lemma dorsally awned, nearly equalling the glumes, its margins united at base; palea wanting.......31. *Alopecurus*

        8. Glumes awn-tipped, persistent as empty husks after fall of floret; awnless lemma and palea much shorter than glumes, free to base.......32. *Phleum*

      7. Glumes not conspicuously keeled or tightly folded; spikelets in open to spike-like panicles.

        9. Rachilla jointed below the very long-awned, pubescent glumes, these falling with floret; panicle dense and spike-like, interrupted, pale and soft, appearing silky from the many slender awns.......33. *Polypogon*

        9. Rachilla jointed above the awnless or very short-awned glumes, these persisting as empty husks; panicle open or contracted.

          10. Grain plump and bladdery to globose, readily falling from the spikelet, loosely invested by its outer membrane, this readily slipping away when moist; palea equalling or exceeding the awnless, 1-nerved lemma, often splitting between the strong nerves at maturity.......34. *Sporobolus*

          10. Grain not plump and bladdery, its outer membrane tightly adherent.

            11. Palea definitely smaller and thinner than the awnless or dorsally-awned lemma, or obsolete; glumes longer than the lemma; floret beardless or very short-bearded at base.......35. *Agrostis*

            11. Palea nearly like the lemma and about as large, 2-nerved.

              12. Lemma with a beard of long hairs at base.

                13. Lemma awnless, 1-nerved, exceeding the first glume, the callus-hairs more than half its length; slender branches of the narrow, pale panicle erect or ascending; elongate leaves tapering above into a long, involute, thread-like apex; culms stout, from elongate scaly rhizomes; plant of prairie sandhills.......36. *Calamovilfa*

13. Lemma awned from middle or near base, 3-5-nerved, the awn included or exserted from side of glumes, these longer than the lemma; callus-hairs shorter than or exceeding lemma; panicle-branches spreading or ascending............37. *Calamagrostis*

12. Lemma smooth at base, (3-)5-nerved, obtuse, a little longer than the acutish glumes; panicle-branches ascending to erect, with some short ones intermixed; plant of wet shores of Hudson Bay. .38. *Arctagrostis*

## Tribe 5. CHLORIDEAE Kunth

1. Spikelets all alike, each with a single perfect floret.

2. Spikelets 3 mm. long, suborbicular, laterally compressed, in short, erect or ascending spikes, these forming a narrow, more or less interrupted, nearly simple panicle; glumes boat-shaped, equal, transversely wrinkled, falling with floret; tufted annual of moist or wet habitats..........................................................39. *Beckmannia*

2. Spikelets 4-15 mm. long, lanceolate to ovate-lanceolate, the narrow glumes unequal; spikes solitary or racemose along the main axis of inflorescence.

3. Spikelets 5-10 mm. long, each with a sterile (rarely staminate) floret borne above the perfect floret on the prolonged rachilla; lemma 3-cleft at summit, each of the divisions short-awned from an excurrent nerve; perennial of dry prairie habitats. . ...........................................................40. *Bouteloua*

3. Spikelets without sterile florets; lemma entire or with 2 rounded teeth at apex.

4. Spikelets 4 mm. long, appressed, alternate and distant along one side of the slender 3-angled rachis, forming very slender stiff spikes, these diverging from the curving main axis of inflorescence; glumes pointed, not falling with floret; leaves short and narrow; low, diffusely branching annual of prairie or open alkaline habitats ...........................................................41 *Schedonnardus*

4. Spikelets 6-15 mm. long, closely overlapping in dense, unilateral, erect to ascending spikes; glumes awned or merely acute, falling with the floret; leaves 1·5-12 dm. long; spreading rhizomes scaly; erect perennials of fresh or alkaline moist habitats ...........................................................42. *Spartina*

1. Spikelets dissimilar, the staminate 2-3-flowered, borne in 1-few elongate spikes in exserted racemes, the pistillate 1-flowered, in capitate clusters sessile in the axils of upper leaves; lemma 3-nerved, whitish; outer pistillate glume thick and rigid, rounded on back, expanded in middle, its summit with 3 green rigid pointed lobes, its inflexed margins enveloping the floret; dwarf, extensively creeping perennial of dry prairie habitats..... ...........................................................43. *Buchloë*

## Tribe 6. PHALARIDEAE Link

1. Lemmas of the 2 lower staminate florets nearly as long as the glumes, boat-shaped, indurated and hairy; glumes thin and papery, broad, rounded on back; spikelets brownish or bronze-coloured, in small, open or contracted panicles...............44. *Hierochloë*

1 Lemmas of the 2 lower sterile florets reduced to small or minute scales; lemma of fertile floret indurated and shining in fruit; glumes boat-shaped, narrowly or prominently winged on the keel; panicle ovate and dense, or narrow and elongate with appressed branches...........................................................45. *Phalaris*

## Tribe 7. ORYZEAE Kunth

A single genus...........................................................46. *Leersia*

## Tribe 8. ZIZANIEAE Hitchc.

A single genus...........................................................47. *Zizania*

## Tribe 9. ANDROPOGONEAE Presl

1. Racemes very numerous, reduced to only 2 or 3 joints, slender-peduncled in a large open panicle, the shining, yellowish-brown or reddish-brown spikelets clothed with fawn-coloured hairs, drooping at maturity................................48. *Sorghastrum*
1. Racemes solitary or digitately clustered, several–many-jointed, flexuous or straight, greenish to purplish, the hairs white to yellowish.....................49. *Andropogon*

## Tribe 10. PANICEAE R. Br.

1. Spikelets each subtended at base by 1-several scabrous bristles, these persisting after fall of the awnless spikelet; inflorescence a cylindric, dense or somewhat interrupted, spike-like panicle..................................................50. *Setaria*
1. Spikelets not subtended by bristles.
   2. Inflorescence a cluster of slender, simple, commonly purplish, often curved, spike-like racemes, these approximate or subdigitate on a short terminal axis; spikelets 1·8-2·2 mm. long, awnless, short-pedicelled, alternate in two rows on one side of the thin-winged rachis..................................................51. *Digitaria*
   2. Inflorescence a panicle with spreading or ascending branches.
      3. Branches of the inflorescence bearing dense, stout, 1-sided racemes of almost sessile spikelets, these awnless or awned, often with bristly hairs; coarse annual chiefly of fields, roadsides, and waste places.............................52. *Echinochloa*
      3. Branches of the symmetrical panicle spreading or ascending, bearing scattered, long-pedicelled, awnless, dorsally compressed spikelets; annual, or, if perennial, frequently with basal winter-rosettes of short leaves unlike the stem leaves......53. *Panicum*

## 1. BROMUS L.

### (Brome-Grass)

[*See* Wagnon, 1952.]

1. Lower glume 1-nerved; upper glume 3-nerved; perennials.
   2. Creeping rhizomes present; anthers 3·5 mm. long or more; branches of panicle ascending to erect, or sometimes spreading.
      3. Lemmas glabrous or minutely scabrous, awnless or with awns up to 3 mm. long; leaves and culms essentially glabrous...........................3. *B. inermis*
      3. Lemmas pubescent along margins and nerves and across back at base, awnless or with awns up to 6 mm. long; upper surface of leaves pilose, the lower surface usually glabrous; culms pubescent near nodes........................4. *B. pumpellianus*
   2. Creeping rhizomes none; anthers less than 3 mm. long; lemmas with awns usually 3-5 mm. long; branches of panicle ascending to spreading or drooping.
      4. Lemmas pubescent on the margins and usually across the back; leaves 6-15 mm. wide, their sheaths overlapping and prominently auricled at summit.......................................................................2. *B. purgans*
      4. Lemmas pubescent on the margins on the lower half to three-fourths, glabrous across the back; leaves usually 5-8 mm. wide, their sheaths mostly shorter than the internodes, not auricled at summit..............................1. *B. ciliatus*
1. Lower glume 3-nerved; creeping rhizomes none.
   5. Upper glume 3-nerved; lemmas pubescent on the margins and usually across the back, 8-13 mm. long, with awns 1·5-3(-4) mm. long; leaves and sheaths usually glabrous; perennial......................................................5. *B. porteri*
   5. Upper glume 5-nerved; lemmas glabrous, 7-9 mm. long, with awns 8-12 mm. long; leaves villous, their sheaths soft-pubescent; annual.................6. *B. japonicus*

1. **B. ciliatus** L. (Incl. *B. dudleyi* Fern.)

Thickets, shores, etc., throughout southern and central Manitoba. Northernmost collection: Gillam, 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Willow Point, near the south end of Lake Winnipeg, damp ground (Macoun, 1884). First report: Lake of the Woods [Dawson, 1875].

Subarctic American: central Alaska to s. Mack., n. Que., s. Lab., and Nfld., s. to s. Calif., Colo., Tenn., and N.C. A map of the area is given by Wagnon [1952, fig. 30], on which circles should be placed to indicate the Gillam station and other northern localities such as Flin Flon, Warren Landing, and Wekusko Lake. The "Oxford House to Knee Lake" report of Bell [1881] remains to be verified.

2. **B. purgans** L. (*B. latiglumis* (Scribn.) Hitchc.)

Open woods, thickets, and clearings of southern Manitoba. Northernmost collection: Lac du Bonnet, roadside (Breitung, 1949). Earliest collection seen: Winnipeg (Malte, 1911). First report: Winnipeg [Jackson *et al.*, 1922].

Temperate American: central Alta. to s. Man. and s. Que., s. to Neb., Okla., and Va. A map of the area is given by Wagnon [1952, map 37].

3. B. INERMIS Leyss.

Thickets and clearings throughout the southern three-quarters of the province. Northernmost collection: Brochet, Reindeer Lake, lat. 57° 55′ N., sandy lakeshore bank by trading post (Baldwin, 1951). Earliest collection seen: Hamiota, 50 miles northwest of Brandon, roadside (Macoun & Herriot, 1906). First report: Jackson *et al.* [1922]. Originally introduced as a hay grass.

Eurasian: according to Wagnon [1952], introduced into the United States about 1884.

Forma *aristatus* (Schur) Fern., with awns up to 3 mm. long terminating the lemmas, has been collected at Winnipeg (Dudley, 1939).

4. **B. pumpellianus** Scribn. (*B. inermis* ssp. *pumpellianus* (Scribn.) Wagnon)

Woodlands, sandy shores, and open habitats almost throughout the province. Northernmost collection: Churchill (Buller, 1939). Earliest collection seen: Fort Ellice, near the Saskatchewan boundary about 80 miles northwest of Brandon, river-banks and moist woodlands (Macoun, 1879). First report: Macoun [1888].

Subarctic American: Alaska and Mack. to n. Man., the Great Lakes region, and e. Ont. (to ?Que.), s. to Mont., Utah, and Colo. Following Wagnon's treatment, the Manitoba plant would be known as *B. inermis* ssp. *pumpellianus* var. *purpurascens* (Hook.) Wagnon, and circles should be added to his map of the area [1952, fig. 36] to indicate its presence in the province north to Churchill.

5. **B. porteri** (Coult.) Nash

Woodlands, thickets, and prairie of southern Manitoba. Northernmost collection: Clear Lake, Riding Mountain, sandy ground (Neatby, 1931). Earliest collection seen: Brandon, thicket (Macoun, 1896). First report: Wagnon [1952].

Temperate western American: B.C. to s. Man., s. to s. Calif., Ariz., and N.M. A map of the area is given by Wagnon [1952, fig. 32].

*B. anomalus* Rupr. is a southern species [*see* map, Wagnon, 1952, fig. 33], and specimens so named are referable to the foregoing species.

*B. kalmii* Gray, according to Wagnon, does not enter Canada [*see* his map, fig. 34], and specimens so named are likewise referable to *B. porteri*. It differs from the latter in its 5-nerved upper glumes and its leaves, which are pilose on both surfaces.

6. B. JAPONICUS Thunb.

Known only from Treesbank, 20 miles southeast of Brandon (Criddle, 1939). First report: Treesbank [Groh & Frankton, 1948].

Eurasian: naturalized almost throughout the United States, and known in Canada from Alberta and Manitoba.

*B. secalinus* L. is reported by Shimek [1927] from railway ballast between Carberry and MacGregor, east of Brandon. Until specimens are available, however, the species must be excluded from our flora.

*B. breviaristatus* Buckl. is reported by Macoun [1888] " Along the Red Deer River, Porcupine Mountain, Man." No specimens have been seen, however, and it is probable that some other species is involved.

### 2. SCHIZACHNE Hack.

1. **S. purpurascens** (Torr.) Swallen (*Melica striata* (Michx.) Hitchc.; *Avena torreyi* Nash)

Woods and thickets throughout southern and central Manitoba. Northernmost collection: Tod Lake, 56° 45′ N., 101° 47′ W. (Ritchie, 1955). Earliest collection seen: Red River (Douglas; the specimen in the National Herbarium of Canada is undated, but, according to Macoun [1888], it was collected in 1827). First report: "Winnipeg and N. W. Angle Road" [Dawson, 1875; as *Avena striata*].

Subarctic American: s. Alaska and Great Bear L. to central Man., central Que., and Nfld., s. to N.M., S.D., Wisc., W. Va., and Pa.

### 3. FESTUCA L.

(Fescue-Grass)

1. Glumes thin and dry, shining, about as long as spikelet; lemmas keeled, prominently 5-nerved, acute to sharp-pointed; stem-leaves only 1 or 2, the blade of the upper one very short; basal leaves numerous, stiff and hard, often involute, early deciduous, their chartaceous sheaths long-persistent; culms densely tufted; plant of dry prairie and sandhills........................................1. *F. altaica* var. *major*

1. Glumes firm and opaque, much shorter than spikelets; lemmas scarcely keeled, awnless or awned; leaf-blades persistent.

2. Stems leafy; basal and cauline leaves flat, 4-11 mm. wide, not densely tufted; lemmas awnless.
   3. Spikelets 8-12 mm. long; lemmas thin, scarious-margined; panicle erect, its short branches ascending in maturity, spikelet-bearing nearly to the base....2. *F. elatior*
   3. Spikelets 3·5-8 mm. long; lemmas firm; panicle diffuse, usually more or less nodding, its finally spreading to reflexed branches spikelet-bearing near the ends........................................................................3. *F. obtusa*
2. Stems with few leaves, these reduced; basal leaves usually densely tufted, filiform or very slender, commonly involute in drying (if flat, not more than 3 mm. wide).
   4. Lower leaf-sheaths brown, red, or purplish, membranaceous, soon becoming fibrous; basal offshoots mostly borne laterally from the old sheaths, forming loose mats; lemmas awned; anthers 2-4 mm. long.
      5. Lemmas glabrous or merely strigose-hirsute; spikelets 7-10 mm. long; branches of panicle often elongate........................................4. *F. rubra*
      5. Lemmas densely villous to lanate; spikelets 1-1·5 mm. long; panicle narrow and spike-like or with short branches....................4a. *F. rubra* var. *arenaria*
   4. Lower sheaths mostly whitish or light brownish, chartaceous, not soon becoming fibrous; new basal offshoots strongly ascending from within the sheaths.
      6. Lemma with awn 1·3-3 mm. long; florets normal.
         7. Anthers 2·5-3 mm. long; panicles mostly 3-10 cm. long, pale green or violet-tinged, with divergent short branches during anthesis..............5. *F. ovina*
         7. Anthers less than 2 mm. long; panicles narrower.
            8. Anthers 1·2-1·7 mm. long; lemmas greenish, strongly involute; panicle 2-10 cm. long.................................5a. *F. ovina* var. *saximontana*
            8. Anthers 0·5-1 mm. long; lemmas purplish or bronze, usually not strongly involute; panicle usually 1-3 cm. long.................. 6. *F. brachyphylla*
      6. Lemma awnless or with awns not longer than 0·6 mm.; stamens wanting, the florets represented by leafy tufts; plant of the Hudson Bay area .....*F. vivipara*

1. **F. altaica** Trin. var. **major** (Vasey) Gleason (*F. scabrella* Torr.; *F. campestris* Rydb.; *F. altaica* ssp. *scabrella* (Torr.) Hult.)

Dry prairie and sandhill habitats of southern Manitoba. Northernmost collection: Riding Mountain, prairie (Mosquin, 1954). Earliest collection seen: Assiniboine Rapids, Man. (Macoun, 1879). First report: "Abundant around Brandon..." [Macoun, 1888].

Subarctic American (including the typical form): n. coast of Alaska and Yukon to Great Bear L., central Sask., and s. Man., s. to Oreg. and Colo.; n. Mich.; n. and e. Que.; Nfld.; ne. Asia.

The plant of Newfoundland and Quebec is treated as the typical form by Gleason [1952], but as *F. scabrella* by Fernald [1925; *see* map, p. 251]. Hultén [1942] follows Fernald in his outline of the area of the two entities, but points out that a specimen from Coldfoot, central Yukon, approaches *F. scabrella*. Because of this uncertainty as regards distribution and the probability that the ranges of variation of the two barely distinct entities overlap, they are combined in the foregoing outline of area.

2. F. ELATIOR L. Meadow-Fescue

Damp soil and clearings of southern Manitoba. Northernmost collection: Riding Mountain (Rowe, 1948). Earliest collection seen: Winnipeg, along streets near Red River (Macoun, 1896). First report: "Introduced as a meadow grass and escaped to roadsides in Red R. valley." [Lowe, 1943].

Eurasian: naturalized in large parts of North America.

Var. *arundinacea* (Schreb.) Wimm., a larger form with spikelets usually 4- to 5-flowered, has been collected at Winnipeg (Dore, 1950).

3. **F. obtusa** Biehler

Moist woods of southern Manitoba, collected at the following localities: Winnipeg, Elm Park by Red River (Macoun, 1896); Morden, rich woods, (Dore, 1950); Miami, 60 miles southwest of Winnipeg, alluvial woods (Dore, 1950). Earliest collection seen: "S. Man., woods" (Burman, 1901). First report: Manitoba included in range of the species given in the 1935 edition of Hitchcock's "Manual of the Grasses of the United States".

Temperate eastern American: s. Man. to N.S., s. to Tex., Miss., and Fla.

4. **F. rubra** L.

Of scattered occurrence in mostly sandy or rocky habitats almost throughout the province. Northernmost collection: Churchill (several collections, the first by Macoun in 1886). Earliest collection seen: Emerson, open prairie (Burgess, 1873). First report: Burman [1910].

(Arctic-)subarctic circumpolar: n. coast of Alaska and Mack. to n. Man., James Bay, northernmost Lab., and Nfld., s. to Calif., Mo., Tenn., and N.C.; Greenland; Iceland; Spitsbergen; Eurasia.

4a. **F. rubra** var. **arenaria** (Osbeck) Fries

Known only from York Factory, where it was collected by the writer in 1949 on gravel beaches of Hayes River. First report: the present publication.

Arctic circumpolar: essentially the range of the species, but also known from Banks and Victoria islands.

Var. *mutica* Hartm., with lemmas awnless or nearly so, is approached, according to Polunin [1940], by a specimen found at Churchill.

Viviparous forms of the species, with many of the spikelets modified into leaves, have been found at Churchill (Polunin, 1936, No. 2001, distributed as *F. vivipara*) and on the Nelson River near the head of tide opposite Gillam Island (Scoggan, 1949, No. 6306, approaching var. *arenaria*).

5. F. OVINA L. Sheep's-Fescue

Most of the material collected under this name has proven to be referable to the following variety, but specimens from Brandon (light dry prairie soil, Stevenson, 1949; land surrounding cemetery, Stevenson, 1950; lawn, Dore, 1950) and Pine Ridge near Winnipeg (sandy top of ridge, Boivin, Löve & Löve, 1951) appear to belong here. First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Eurasian: naturalized in the United States and adjacent parts of Canada.

Forma *hispidula* (Hack.) Holmb., with hispid lemmas, has been collected at Brandon in similar habitats (Stevenson, 1949).

5a. **F. ovina** var. **saximontana** (Rydb.) Gl. (*F. brachyphylla* Schultes ssp. *saximontana* (Rydb.) Hult.)

Dry sandy and rocky habitats throughout the southern half of the province. Northernmost collection: Nelson River 20 miles northeast of Norway House, dry schists (Scoggan, 1948). Earliest collection seen: Assiniboine Rapids, near Portage la Prairie, dry slopes (Macoun, 1879). First report: Lowe [1943; but erroneously indicated as synonymous with *F. ovina*].

Subarctic American: central Alaska, Great Slave L., and central Man. to w. Lab. and w. Nfld., s. to Utah, Neb., Minn., Mich., and e. Que. The report of *F. octoflora* Walt. from Carberry by Shimek [1927] was probably based upon a collection of this species.

6. **F. brachyphylla** Schultes. (*F. ovina* var. *brevifolia* (R. Br.) Wats.)

Known in the province only from Churchill (several collections, the first by Porsild in 1930); Nueltin Lake, lat. 59° 48′ N. (sandy esker, Baldwin, 1951); and sandy or rocky ground by Cochrane River and Reindeer Lake (Baldwin, 1951). First report: Churchill [Størmer, 1933]; but reported by Rae [1850] "between Churchill and Repulse Bay".

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to lat. 80° N.), n. Que., n. Lab., and Nfld., s. to Calif., Nev., Colo., n. Mich., and e. Que.; circumgreenlandic; n. Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XV]. The report of *F. ovina* var. *duriuscula* (L.) Koch from Hudson Bay by Lowe [1943] undoubtedly refers to this species.

*F. vivipara* (L.) Sm.: an undated collection from "L. Winipeg" (Bourgeau's usual spelling) in the Gray Herbarium of Harvard University has been referred to this species by Fernald. A specimen in the National Herbarium of Canada collected at Churchill by Polunin in 1936 was distributed under this name, but, according to Dore, is a viviparous form of *F. rubra*. Until more is known of the occurrence of this species in Manitoba, it is felt best to exclude it from our flora.

## 4. Puccinellia Parl.

### (Alkali-Grass)

[*See* Fernald & Weatherby, 1916; Sørensen, 1953.]

1. Stems decumbent and forming close mats, from elongate, bulblet-bearing, over-ground runners; lemmas entire, 3·5-4·5 mm. long; anthers 1·3-2 mm. long; grains rarely or never developed; plant of the Hudson Bay region.................1. *P. phryganodes*
1. Stems mostly ascending or decumbent only at base, without runners; grains developed.
    2. Lemmas entire, 2-4 mm. long; anthers 0·5-1 mm. long; grain 1·3-2·1 mm. long; plant of the Hudson Bay region.......................................*P. pumila*
    2. Lemmas erose-ciliolate.
        3. Culms leafy only near base; spikelets reddish-purple, suffused with golden-yellow; lemmas 2·4-2·8 mm. long; anthers 0·7-0·9 mm. long; grain about 2 mm. long; plant of the Hudson Bay region........................3. *P. deschampsioides*
        3. Culms leafy to or above the middle; spikelets green or purple-tinged.
            4. Lemmas 3-4 mm. long; anthers 1-1·2 mm. long; grain 1·8-2 mm. long; plant of the Hudson Bay region....................................5. *P. lucida*
            4. Lemmas 1·5-3 mm. long; anthers 0·6-0·9 mm. long; grain 1-1·9 mm. long.
                5. Lemmas 1.5-2 mm. long, blunt or subacute at apex; anthers 0·6-0·7 mm. long; grain 1-1·2 mm. long.................................4. *P. nuttalliana*

5. Lemmas 2-2·5 mm. long, rounded or truncate at apex; anthers 0·6-0·9 mm. long; grain 1·4-1·9 mm. long.
    6. Panicle-branches finally deflexed, flowering chiefly above the middle; spikelets 4-5 mm. long; anthers 0·7-0·9 mm. long; grain 1·4 mm. long; plant introduced into the southern half of the province...........6. *P. distans*
    6. Panicle-branches ascending or spreading, flowering nearly to base; spikelets 4·5-8 mm. long; anthers 0·6-0·8 mm. long; grain 1·7-1·9 mm. long; plants of the Hudson Bay region.
        7. Glumes obscurely nerved, obtuse, the lower one 0·7-1 mm. long, ovate, the upper one 1·4-1·8 mm. long, suborbicular..........2. *P. vaginata*
        7. Glumes evidently nerved, the lower one 1·2-2 mm. long, narrow, acute, the upper one 2·2-2·6 mm. long, obovate. .2a. *P. vaginata* var. *paradoxa*

1. **P. phryganodes** (Trin.) Scribn. & Merr.

Known in Manitoba only from Churchill: around sloughs (Beckett, 1948); fine wet gravel at tide mark (Gillett, 1948); dense mats in calcareous gravel on shore-line of brackish lagoon (Dore, 1949). First report: Churchill [Ritchie, 1956].

Arctic circumpolar: n. coast of Alaska and Mack., Can. Arct. Arch., n. Que., and n. Lab., s. along the coasts of James Bay and s. Lab.; circumgreenlandic (with gaps); Spitsbergen; n. Eurasia.

*P. pumila* (Vasey) Hitchc.: a specimen in the National Herbarium of Canada collected at Churchill by Polunin in 1936 and distributed as *P. alaskana* has been annotated by Sørensen as falling within the limits of this species as broadly defined. Fernald [1950] includes the species in the synonymy of *P. paupercula* var. *alaskana* and ascribes to it a coastal distribution in both eastern and western North America. Sørensen [1953], however, considers the eastern plant to be either specifically or varietally distinct from the western one. In view of the present controversy and the position of Churchill as an intermediate station between the areas of the two or more entities involved, it is felt that the species should not be admitted to our flora on the basis of the single specimen seen.

2. **P. vaginata** (Lange) Fern. & Weath.

Known in Manitoba only from Churchill, where it was collected in 1930 by Porsild (No. 5390, distributed as *P. retroflexa*, but placed by Sørensen in the present species). First report: the present publication.

Arctic American: n. coast of Yukon and Mack., Victoria I., n. Baffin I., s. along the west coast of Hudson Bay to Churchill; Greenland to about lat. 78° N.; in n. Que. and n. Lab., var. *elegans* Sørenson.

2a. **P. vaginata** var. **paradoxa** Sørensen

Known in Manitoba only from Churchill, where it was collected in 1930 by Porsild (No. 5389, distributed as *P. retroflexa*, but placed here by Sørensen). First report: the present publication.

(Arctic-)subarctic eastern American: coast of ne. Man., s. Baffin I., and n. Lab.; e. and w. Greenland.

3. **P. deschampsioides** Sørensen

A specimen in the National Herbarium of Canada collected at Churchill by Duman (No. 1268, "growing in dense tufts in wet peat soil", distributed as *P. lucida*) is annotated by Sørensen as "a very doubtful *lucida*, in some way approaching *P. deschampsioides*". This and a 1948 Churchill collection of Gillett (No. 2223, distributed as *P. lucida*) presumably form the basis of the citation of a slightly deviating form of the species from the southern Hudson Bay region by Sørensen [1953].

(Arctic-)subarctic American: Mack. (island off n. coast), Great Bear L., ne. Man. (Churchill), and n. Que. (Hudson Str.); e. Greenland.

4. **P. nuttalliana** (Schultes) Hitchc. (*P. airoides* (Nutt.) Wats. & Coult.; *P. tenuiflora* (Griseb.) Scribn. & Merr.).

Wet or damp soils, chiefly alkaline, throughout the province. Northernmost collection: Nejanilini Lake, lat. 59° 22′ N., sand-gravel ridge near trading post (Scoggan & Baldwin, 1950). Earliest collection seen: "Salt Lakes, Man." (Macoun, 1872). First report: "Very abundant in saline marshes throughout the interior west of Winnipeg..." [Macoun, 1888; as *Glyceria distans* var. *airoides*].

Subarctic western American: se. and interior Alaska (Hultén, 1950) to Great Slave L. and n. Man., s. to Calif., N.M., Tex., and Minn.; introduced locally eastward.

5. **P. lucida** Fern. & Weath.

Known in Manitoba only from Churchill, where it was first collected by Birket-Smith in 1923 (distributed as *P. arctica*, but considered by Sørensen to belong here). First report: Churchill [Sørensen, 1953].

(Subarctic-)temperate eastern American: Churchill, Man.; James Bay; e. Que.

6. P. DISTANS (L.) Parl.

Damp or wet soils, chiefly alkaline, of roadsides and waste places throughout the southern half of the province. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: Winnipeg (Malte, 1917). First report: Lowe [1943]; the citation of the species from Kettle Rapids, about 160 miles south of Churchill, however, is erroneous; the plant collected there by Jackson in 1918 has been renamed *P. borealis* Swallen by Dore, but in view of the tremendous gap between this locality and the main area of the species (Alaska and Yukon), and the extreme complexity of the northern members of the genus, it is felt unwise to admit *P. borealis* to our flora at the present time.

European: widely introduced into the northern United States and adjacent parts of Canada.

*P. angustata* (R. Br.) Rand & Redf. is cited from Hudson Bay in the checklist of Jackson *et al.* [1922]. This species, however, is markedly high-arctic, not occurring in Canada south of the arctic coastline. The plant involved, of which no specimen seems to exist, presumably belongs to one of the Churchill plants treated above.

*P. tenuiflora* (Griseb.) Scribn. is cited by Lowe [1943] from north of Baldur, but specimens so named are probably *P. nuttalliana* [*see* Sørensen, 1953, p. 87].

*P. langeana* Th. Sør. is reported from "fine wet gravel on the beach at tide level" (Gillett, Nos. 2570, 2571) near Churchill by Ritchie [1956].

## 5. Glyceria R. Br.

### (Manna-Grass)

[*See* Church, 1949.]

1. Spikelets linear, 1-4 cm. long, 7-13-flowered; leaf-sheaths strongly compressed, 2-edged.
  2. Spikelets 10-18 mm. long, slender-pedicelled; upper glume 2-3 mm. long; lemmas 3-4 mm. long; anthers 0·6-1 mm. long; grain 1·2-1·6 mm. long; leaf-blades 2-5 mm. wide ........ 1. *G. borealis*
  2. Spikelets 2-4 cm. long, subsessile; upper glume 3-4 mm. long; lemmas 6-8 mm. long; anthers 1·8-3 mm. long; grain 3 mm. long; leaf-blades 4-8 mm. wide.... *G. fluitans*
1. Spikelets ovate, 2-6 mm. long; leaf-sheaths roundish in cross-section.
  3. Upper glume about 1 mm. long, twice as long as the lower.............. 2. *G. striata*
  3. Upper glume 2-2·5 mm. long, not much exceeding the lower.
    4. Glumes acute, whitish; lemmas purple, barely scarious-margined, 2-2·7 mm. long; spikelets 4-8-flowered; leaf-blades 6-15 mm. wide; culms 1-1·5 m. high. . 3. *G. grandis*
    4. Glumes obtuse, brownish or purplish; lemmas purple, with broad scarious margins, about 3 mm. long; spikelets 4-6-flowered; leaf-blades 2·5-6 mm. wide; culms 4-6 dm. high........................................... 4. *G. pulchella*

1. **G. borealis** (Nash) Batchelder Small Floating Manna-Grass

Wet places or shallow water throughout the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., marshy shore (Baldwin, 1951). Earliest collection seen: Hamiota, 35 miles northwest of Brandon (Macoun & Herriot, 1906). First report: Poplar Point, 35 miles southeast of Brandon (Campbell collection cited in undated supplement to the 1943 checklist of Lowe).

Subarctic American: central Alaska and Yukon to n. Man., James Bay, s. Lab., and Nfld., s. to Calif., Ariz., Colo., S.D., and Pa.

*G. fluitans* (L.) R. Br. is reported by Macoun [1888], Burman [1910], Jackson *et al.* [1922], and Lowe [1943] from the province. It probably occurs in Manitoba, but no specimens have been seen.

2. **G. striata** (Lam.) Hitchc. (Incl. var. *stricta* (Scribn.) Fern.) Fowl-meadow Grass

Moist ground or shallow water almost throughout the province. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: Souris Plain, wet places (Macoun, 1883). First report: Dufferin, near Carman, and "Winnipeg and N. W. Angle Road" [Dawson, 1875].

Subarctic American: central Alaska, n. Alta., and n. Man. to James Bay, interior Lab., and Nfld., s. to Oreg., N.M., Tex., and Fla. The writer finds it impossible to segregate satisfactorily var. *stricta* from the typical form, and agrees with Fassett [1951] that there seems insufficient correlation of characters to warrant its recognition as a separate entity.

3. **G. grandis** Wats. (*G. maxima* (Hartm.) Holmb. ssp. *grandis* (Wats.) Hult.) Reed-meadow Grass

Wet ground and shallow water throughout the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., lake shore (Baldwin, 1951). Earliest collection seen: Dufferin, near

Emerson, swamp (Burgess, 1873). First report: Warren Landing [Lowe, 1920; as *Panicularia grandis*]. The plant cited from various Manitoba localities by Macoun [1888] as *G. arundinacea* probably belongs here.

Subarctic American: central Alaska and Yukon to Great Slave L., James Bay, and Nfld., s. to Oreg., N.M., Ia., Tenn., and Va. A map of the northern part of the distribution is given by Raup [1930, map 37].

4. **G. pulchella** (Torr.) Trin.

Wet soil and shallow water of the southern half of the province. Northernmost collection: Norway House, rock crevices (Scoggan, 1948). Earliest collection seen: Winnipeg (Groh, 1921). First report: the present publication.

Subarctic western American: central Alaska to n. Alta. and central Man., s. to N.M.

*G. pallida* (Torr.) Trin. (*Torreyochloa pallida* (Torr.) Church) is stated by Lowe [1943] to have been recorded in an earlier Manitoba list, but without locality. Its western limit, according to Fernald, is southern Ontario, and it should be withheld from our flora for the present.

### 6. SCOLOCHLOA Link

1. **S. festucacea** (Willd.) Link. (*Fluminia festucacea* (Willd.) Hitchc.) Sprangle-top

Marshes and shallow water throughout the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, shallow water (Scoggan, 1948). Earliest collection seen: Lake of the Woods, Man. (Dawson, 1873). First report: "Ponds, Souris Plain, Man." [Macoun, 1888; as *Fluminia arundinacea*].

(Subarctic-)temperate western America: B.C. and n. Alta. to central Man., s. to Oreg., Neb., and Ia. A map of the northern part of the distribution is given by Raup [1930, map 26], on which the northernmost Manitoba locality should be indicated.

### 7. POA L.

### (Meadow-Grass)

[*See* Marsh, 1952.]

1. Lemmas cobwebby at base (the web sometimes scant or obscure in No. 9).
  2. Plant stoloniferous; intermediate nerves of lemmas distinct.
    3. Lemmas 4-5 mm. long, densely villous on midnerve and marginal nerves, the intermediate nerves pubescent below; panicle open, the spreading lower branches spikelet-bearing only toward tip; plant of the Hudson Bay region.....7. *P. arctica*
    3. Lemmas 2-3 mm. long, the midnerve and marginal nerves merely pubescent; lower panicle-branches spikelet-bearing chiefly to near middle.
      4. Intermediate nerves of lemma glabrous; panicle ellipsoid-ovoid to pyramidal; culms nearly all bearing new green leaves at base..............3. *P. pratensis*
      4. Intermediate nerves of lemma pubescent; panicle mostly narrower; new basal leaf-tufts chiefly on separate offshoots; plant of the Hudson Bay and northern regions................................................4. *P. alpigena*

- 2. Plants non-stoloniferous; intermediate nerves of lemma obscure.
    - 5. Ligules 2-4 mm. or more long; leaves 2-4 mm. wide; lemmas copiously webbed at base, not thin-edged; anthers 0·8-1 mm. long; culms loosely tufted.................................................................... 8. *P. palustris*
    - 5. Ligules usually less than 1 mm. long; leaves 1-3 mm. wide; lemmas sparsely webbed at base, thin-edged; anthers 1·2-1·5 mm. long; culms in dense clumps.................................................................. 9. *P. nemoralis*
- 1. Lemmas not cobwebby at base, or only sparingly so.
  - 6. Plants stoloniferous; nerves of lemma pubescent, at least below.
    - 7. Culms strongly flattened, 2-edged, wiry; panicle narrow, its ascending short branches spikelet-bearing to near base; lemmas 2-3 mm. long..............2. *P. compressa*
    - 7. Culms round in cross-section; panicle-branches spikelet-bearing chiefly above the middle; lemmas 3 mm. long or more.
      - 8. Lemmas 4-5 mm. long, densely long-villous on midnerve and marginal nerves, the intermediate nerves pubescent; panicle open, the spreading lower branches spikelet-bearing only toward tip; plant of the Hudson Bay region...7. *P. arctica*
      - 8. Lemmas 3-4 mm. long, the nerves pubescent, not long-villous; lower panicle-branches spikelet-bearing chiefly to near middle or below; prairie species.
        - 9. First (lower) glume 2·5-3 mm. long, 1-nerved; lowest floret about 3 mm. long; anthers 1·5 mm. long........................................5. *P. arida*
        - 9. First glume 4-5 mm. long, 3-nerved; lowest floret 5 mm. long; anthers 2·5 mm. long..........................................6. *P. glaucifolia*
  - 6. Plants non-stoloniferous.
    - 10. Plant annual, tufted, the decumbent base sometimes rooting at the nodes; leaves very soft; nerves of lemma pubescent, the intermediate nerves distinct; anthers 0·5-1 mm. long..........................................1. *P. annua*
    - 10. Plants perennial, the culms bearing persistent old leaves or dry sheaths; intermediate nerves of lemma obscure.
      - 11. Lemmas glabrous or merely scabrous, 4·5-6 mm. long; leaves filiform; plant of dry prairie habitats.....................................12. *P. cusickii*
      - 11. Lemmas pubescent, at least on midnerve and marginal nerves, 3-4 mm. long; leaves 1 mm. wide or more.
        - 12. Glumes ovate; panicle ellipsoid to pyramidal, about as broad as long, the lower branches spreading or sometimes reflexed; leaves 2-6 mm. broad, blunt; culms round in cross-section, their bases covered with papery, whitish sheaths........................................10. *P. alpina*
        - 12. Glumes lanceolate; panicle open or contracted, usually longer than broad; leaves 0·5-2·5 mm. broad, attenuate; culms compressed.....11. *P. glauca*

1. P. ANNUA L. Annual Bluegrass

Waste ground and clearings almost throughout the province. Northernmost collection: Cochrane River, lat. 57° 58′ N., sandy path of portage through black spruce forest (Baldwin, 1951). Earliest collection seen: Ochre River, south of Dauphin Lake (Jackson, 1920) First report: Winnipeg, lawns [Jackson *et al.*, 1922].

Eurasian: naturalized in N. Am. from Alaska to Nfld., s. to Mex.

2. P. COMPRESSA L. Wiregrass

Dry soil throughout the southern half of the province. Northernmost collection: Norway House, rock outcrops (Scoggan, 1948). Earliest collection seen: Brandon, along the Assiniboine (Macoun, 1896). First report: Burman [1910].

Eurasian: naturalized in N. Am. from Alaska to Nfld., s. to Okla. and Ga.

3. **P. pratensis L.** Kentucky Bluegrass

Moist or dry soil throughout the province. Northernmost collection: Churchill (several collections, the first apparently by Buller in 1939). Earliest collection seen: Brandon, hillside (Macoun, 1896). First report: Dufferin, near Carman, open prairie [Dawson, 1875].

(Arctic-)subarctic circumpolar: Alaska Pen. to Great Bear L., n. Man., James Bay, n. Que., n. Lab., and Nfld., s. throughout most of the U.S.; s. Greenland; Iceland; Eurasia. A map of the northern part of the American area of the species, including *P. alpigena*, is given by Raup [1947, pl. XV].

4. **P. alpigena** (Fr.) Lindm.

Moist or dry soil, often gravelly or rocky, throughout the northern half of the province. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet black spruce woods and gravel spit (Baldwin, 1951). Earliest collection seen: Churchill (Macoun, 1910). First report: Hayes River [Scoggan, 1951].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack. to central Keewatin, central Baffin I., n. Que., n. Lab., and Nfld. (in the Canadian Arctic Archipelago, var. *colpodea* (Fr.) Schol.) s. to s. Alaska, Great Slave L., central Man., James Bay, and Gaspe Peninsula; southern half of Greenland; Iceland; arctic Eurasia.

5. **P. arida** Vasey (*P. pratericola* Rydb.)

Dry or moist prairie habitats of southern Manitoba. Specimens have been seen from the following localities: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873); Sewell, now Camp Hughes, near Brandon (Macoun & Herriot, 1906); Forrest, north of Brandon (Macoun & Herriot, 1906); Napinka, 55 miles southeast of Brandon (Dore, 1950); Morden (Dore, 1950); Brandon (Dore, 1950; Stevenson, 1951); Melita (Scoggan, 1953). First report: Jackson *et al.* [1922; *P. arida* and the identical *P. pseudopratensis*].

(Subarctic-)temperate western American: s. B.C., n. Alta., central Sask., and s. Man., s. to Ariz., Tex., and Ia. A map of the northern part of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1930, map 24].

6. **P. glaucifolia** Scribn. & Will.

Dry or moist prairie habitats of southwestern Manitoba. The following specimens, determined by Dore, have been seen: Lyleton, 80 miles southwest of Brandon (Clarke, 1938); Bede, 55 miles southwest of Brandon (Dore & Lindsay, 1950). First report: the present publication.

Temperate western American: B.C. to sw. Man., s. to Nev., Ariz., N.M., and Neb.

7. **P. arctica** R. Br. (*P. rigens* Hartm.; *P. cenisia* of Am. auth., not All.)

Moist soil of the Hudson Bay coastal area, where it has been collected at Churchill (several collections, the first by Porsild in 1930) and York

Factory (Scoggan, 1949). First report: Churchill [Størmer, 1933; as *P. rigens*]; but reported by Rae [1850] "between Churchill and Repulse Bay".

Arctic American: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch., n. Que., and coast of Lab., s. in the mts. to Oreg. and N.M.

8. **P. palustris** L. (*P. serotina* Ehrh.; *P. triflora* Gilib.) Fowl-meadow Grass

Damp soil almost throughout the province. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: Lake of the Woods, Man. (Dawson, 1873). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Subarctic circumpolar: central Alaska and Yukon to n. Man., central Lab., and Nfld., s. to Calif., Neb., Ind., and N.C.; Eurasia; n. Afr.

9. **P. nemoralis** L. (Incl. var. *interior* (Rydb.) Butters & Abbe)

Dry or moist soil almost throughout the province (probably introduced in the northern section). Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: Sewell, now Camp Hughes, near Brandon, open prairie (Macoun, 1896). First report: Lowe [1943; *P. interior*]. The citing of *P. caesia* Sm. var. *strictior* Gray from Red River by Dawson [1875] was probably based upon a collection of *P. nemoralis*; as noted by Butters & Abbe [1947], the former name is synonymous with *P. glauca*, a more northern species.

(Subarctic-)temperate circumpolar: sw. Alaska to n. Man., south-central Lab., and Nfld., s. to B.C., Neb., O., and N.E.; s. Greenland; Iceland; Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XV], on which the Churchill station should be indicated.

As pointed out by Fernald [1950], the species is a polymorphic one in need of critical study. Such characters as pubescence of spikelet-rachis and length of spikelets, glumes, and ligules have been used in an attempt to divide the species into distinct Old World and New World entities, but, according to Butters & Abbe [1947], some undoubtedly native American specimens fall within the range of variability of these characteristics accorded the Eurasian plant. Much American material is characterized by a ligule-length of about 1 mm., rather than 0·5 mm. or less in the typical plant, and there appears to be a correlated tendency toward reduction in number of the lower panicle-branches. Despite these rather trivial differences, however, it seems best at present to include the supposedly distinct var. *interior* in the treatment of the main form.

10. **P. alpina** L.

Gravelly or rocky, often calcareous, shores, outcrops, and clearings north of lat. 51°. Southernmost collection seen: Ashern, 80 miles north of Portage la Prairie, limestone "pavement" (Scoggan, 1951). Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: "Winipeg Valley" (Bourgeau, 1859). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Arctic circumpolar: Seward Pen., Alaska, to Great Bear L., central Keewatin, central Baffin I., n. Lab., and Nfld., s. to Oreg., Utah, Colo., the Great Lakes region, and e. Que.; southern half of Greenland; Iceland; Spitsbergen; Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XV].

11. **P. glauca** Vahl (*P. caesia* Sm.; *P. caesia* var. *strictior* Gray)

Dry, often calcareous, rocks, gravels, and shores throughout the province, but commonest northward. Northernmost collection: Baralzon Lake, lat. 60° N., rocky barrens (Scoggan & Baldwin, 1950). Earliest collection seen: an undated Richardson collection in the Gray Herbarium of Harvard University, bearing the annotation "Lake Winnipeg", was presumably collected between the years 1819-22. The earliest dated specimen seen was collected by Macoun on the Assiniboine River in 1879. First report: Red River [Dawson, 1875; as *P. caesia* var. *strictior*].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (north to central Ellesmereland), n. Que., n. Lab., and Nfld., s. to Wash., Utah, Colo., the Great Lakes region, and n. N.E.; circumgreenlandic (with gaps); Iceland; Spitsbergen; Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XV].

12. **P. cusickii** Vasey. (*P. subaristata* Scribn.)

Dry prairie and sandhills of southwestern Manitoba. Specimens have been seen from Brandon (Macoun, 1896; Malte, 1918; Stevenson, 1950) and Oak Lake, 30 miles west of Brandon (Scoggan, 1953). First report: the present publication.

Temperate western American: s. B.C. to sw. Man., s. to Calif. and Colo.

"*Poa aquatica* (*Glyceria arundinacea*)" reported by Jackson *et al.* [1922] from Lake Winnipeg, is presumably *Glyceria grandis* Wats. (*P. aquatica* var. *americana* Torr.), listed also by Jackson as *Panicularia grandis.*

*P. crocata*, reported by Jackson *et al.* from Brandon, is listed by Hitchcock [1950] under the synonymy of *P. palustris*, although, as indicated by Butters & Abbe [1947], Rydberg's concept of the species included much of *P. glauca* (*P. caesia*) and the *P. nemoralis* complex.

*P. eminens* Presl is cited from Churchill by McClure [Ecological Monographs, vol. 13, 1943], but its presence there is extremely doubtful [*see* Potter, 1932, map 3]. It is possible that the citation is based upon the large-flowered *P. arctica.*

*P. flexuosa* Muhl., reported (with a mark of interrogation) by Dawson [1875] from Red River, is listed by Hitchcock [1950] under the synonymy of *P. autumnalis* Muhl., and noted by Fernald [1950] as reaching its western limit in southern Michigan and Illinois. Its presence in Manitoba is extremely doubtful.

*P. laxa* Haenke is reported by Macoun [1888] from such climatically divergent localities as Emerson, near the International Boundary, and Nelson River. The rather fragmentary Emerson specimen in the herbarium of McGill University (Dufferin, open prairie, Burgess, 1873) appears to be *P. arida* Vasey. The Nelson River specimen has not been seen. According to Nannfeldt [Symb. Bot. Upsal., vol. 5, 1935], true *P. laxa* is confined to the mountains of central and southern Europe, whereas its eastern North American representative, *P. fernaldiana*, is confined to the Atlantic provinces and states.

*P. nervosa* (Hook.) Vasey is cited in an undated appendix to Lowe's checklist from St. Lazare and "Poplar Point". Specimens were unavailable, but in view of the area given by Marsh [1952; "Known only west of the Cascade Mountains from northern central Oregon to Vancouver Island, B.C."], the species may safely be excluded from our flora.

*P. secunda* Presl is also cited in the aforementioned appendix from "Poplar Point". Until specimens are available, however, this species should be excluded from our flora, although both it and the very similar, if not identical, *P. canbyi* (Scribn.) Piper (*P. tenuifolia* Nutt., not L.; listed by Burman) occur in neighbouring North Dakota.

*P. trivialis* L. is cited from Riding Mountain by Lowe [1943], but no specimen has been seen. Fernald [1950] gives the northern part of the range as Newfoundland to Ontario. The species should be carefully searched for in Manitoba.

### 8. ARCTOPHILA Griseb.

1. **A. fulva** (Trin.) Rupr. (*Colpodium fulvum* (Trin.) Griseb.)

Known in Manitoba only from the following locality: Baralzon Lake, lat. 60° N., shallow water at edge of pond (Scoggan & Baldwin, 1950; sterile specimen determined by A. E. Porsild). First report: the present publication.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (n. to Prince Patrick I.), and n. Que., s. to s. Yukon, n. Man., and the east coast of Hudson Bay near Port Harrison; sw. Greenland; Spitsbergen; arctic Eurasia.

### 9. DUPONTIA R. BR.

1. Lemmas awnless....................................................1. *D. fisheri*
1. Lemmas short-awned.................................1a. *D. fisheri* var. *aristata*

1. **D. fisheri** R. Br. (Incl. f. *psilosantha* (Rupr.) Polunin)

Known in Manitoba from only the following stations: Churchill, salt marsh (Dore, 1949); York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949). First report: Churchill [Radforth, 1950].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct Arch. (north to central Ellesmereland), and n. Lab., s. to interior Alaska, James Bay, and central Lab.; e. and w. Greenland; Spitsbergen; arctic Eurasia.

1a. **D. fisheri** var. **aristata** Malte & Polunin

Known in Manitoba only from Churchill, where it was collected in a salt marsh by Dore in 1949 together with the typical form. First report: the present publication.

Total area not known but widely distributed in the Canadian Arctic.

### 10. DACTYLIS L.

(Orchard-Grass)

1. D. GLOMERATA L.

Collections have been seen from only the following localities: Brandon, along the railroad (Macoun, 1896); Winnipeg (Burman, 1901). First report: Burman [1910].

Eurasian: widely naturalized in North America.

### 11. ERAGROSTIS Beauv.

(Love-Grass)

1. Culms capillary, rooting at the nodes and forming prostrate mats; lemmas 1·5-2 mm. long, glabrous; panicles simple or but slightly forked, usually open, 1-6 cm. long; leaf-blades scabrous or pubescent on upper surface, their sheaths glabrous; plant of wet ground..........................................................1. *E. hypnoides*

1. Culms ascending or somewhat depressed, not mat-forming; lemmas 2-2·6 mm. long, scabrous, they and the glumes somewhat glandular; panicles greenish-lead-colour, dense or somewhat open, 5-20 cm. long; margins of leaf-blades bordered by wart-like glands; strong-scented plant of waste places..............................2. *E. cilianensis*

1. **E. hypnoides** (Lam.) BSP.

Gravelly or muddy shores in the southern part of the province. Northernmost collection seen: Grand Beach (McMillan, 1936). Earliest collection seen: banks of the Assiniboine River (McMorine, 1899). First report: Lowe [1943].

Temperate American: Wash. to s. Man. and s. Que., s. throughout most of the U.S. to Mex. and S. Am.

2. E. CILIANENSIS (All.) Link (*E. megastachya* (Koel.) Link) Snakegrass

Known in the province at only the following localities: Brandon, dry wasteland (Stevenson, 1950); Morris, railroad yard, cinders (Scoggan, 1953). First report: the present publication.

Eurasian: widely naturalized in the U.S., Mex., and S. Am., and spreading into Canada.

### 12. CATABROSA Beauv.

1. **C. aquatica** (L.) Beauv. Water Hairgrass

Occasional in fresh or brackish marshy ground or shallow water in the southern three-quarters of the province. Northernmost collection: York Factory, edge of pool (Scoggan, 1949). Earliest collection seen: Dufferin, near Carman, swamp (Burgess, 1873). First report: York Factory [Hooker, 1840].

(Subarctic-)temperate circumpolar: central Alta. to n. Man., central Que., s. Lab., and Nfld., s. to Nev., Ariz., Colo., and Neb.; sw. Greenland; Iceland; Eurasia. The western American plant has been treated by some authors as var. *uniflora* Gray.

### 13. DISTICHLIS Raf.

(Alkali-Grass)

1. **D. stricta** (Torr.) Rydb. (*D. spicata* (L.) Greene var. *stricta* (Gray) Beetle)

Moist alkaline soils or saline marshes throughout the southern third of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, salt marsh at mouth of Red Deer River (Scoggan, 1948). Earliest collection seen: "Manitoba, Salt Plains" (Macoun, 1872). First report: Macoun [1888; as *D. maritima* var. *stricta*].

Temperate western American: B.C. to Man., s. to Calif., Tex., Mo., and Mex.

*D. spicata* (L.) Greene is included in the checklists of Jackson *et al.* [1922] and Lowe [1943], but all material seen is of the preceding species. Its distribution is shown on a map of Steyermark [Rhodora 42, p. 23, 1940].

## 14. PHRAGMITES Trin.

### (Reed)

1. **P. communis** Trin. var. **berlandieri** (Fourn.) Fern.

Shores and shallow water throughout the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, shallow water (Scoggan, 1948). Earliest collection seen: Grassy Narrows, Lake Winnipeg (between Hecla I. and the mainland) (Macoun, 1884). First report: the present publication; basis of reports of the main form from the province. It is the tallest of our Manitoba grasses.

(Subarctic-)temperate American: B.C. and n. Alta. to e. Que., s. to Tex., La., Ind., and Md.; with the species, circumpolar.

## 15. AGROPYRON Gaertn.

### (Wheat-Grass)

1. Spikes short (5-9 cm. long), oblong, comb-like, somewhat twisted, the spikelets divergent in two opposite rows; leaves short and rigid, promptly inrolled; plants forming dense tussocks, without creeping rhizomes. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .1. *A. cristatum*

1. Spikes narrower, mostly longer, not comb-like, the spikelets ascending to appressed; leaves longer, flat or involute.

2. Creeping rhizomes present; mature spikelets falling entire (except sometimes in No. 2); anthers 3-7 mm. long.

3. Lemmas densely covered with somewhat tangled hairs; glumes acute or abruptly awn-pointed; spikelets 3-16-flowered; leaf-blades pale, firm, often involute, 1-3 mm. wide. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .2. *A. dasystachyum*

3. Lemmas glabrous to somewhat hairy.

4. Cartilaginous band of upper nodes of culm shorter than thick; glumes rigid, tapering from below middle to the short-awned apex, rather faintly nerved; spikelets 15-30 mm. long, with 6-16 florets; leaf-blades firm or rigid, glaucous, mostly involute, 4-6 mm. wide, deeply grooved on upper surface.

5. Lemmas glabrous or nearly so. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .3. *A. smithii*

5. Lemmas pubescent. . . . . . . . . . . . . . . . . . . . . . . . . . .3a. *A. smithii* var. *molle*

4. Cartilaginous band of upper nodes as long as thick; glumes not rigid, narrowed from near middle to the awned or awnless apex, usually strongly nerved; spikelets 10-18 mm. long, with 3-6(-9) florets; leaf-blades lax, with crowded fine nerves, flat, mostly 6-10 mm. wide.

6. Glumes abruptly narrowed to the apex, with broad scarious margins. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4. *A. repens*

6. Glumes gradually tapering from near middle to the apex, their margins narrow or involute. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4a. *A. repens* var. *subulatum*

2. Creeping rhizomes absent; glumes persistent after fall of florets; anthers 1-3 mm. long.

7. Glumes with broad, thin margins, unsymmetrical at the awned tip; lemmas commonly pubescent; spike rarely more than 7 cm. long, the spikelets closely overlapping; plant of the Hudson Bay region. . . . . . . . . . . . . . . . . . . . . . .5. *A. latiglume*

7. Glumes not thin-margined, awned or awnless; lemmas glabrous; spike 5-25 cm. long, the spikelets from rather remote to closely overlapping.

8. Awns wanting or at most about half as long as the lemma.

9. Spikelets not crowded, the tip of one not reaching the base of the next upper one on the same side; internodes of rachis often 4-angled. . .6. *A. trachycaulum*

9. Spikelets closer, the tip of one overlapping the base of the next upper one on the same side; internodes of rachis mostly 2-angled.

10. Body of glumes 10-16 mm. long; fruiting spike 5-12 mm. thick. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .6a. *A. trachycaulum* var. *majus*

10. Body of glumes 7-10 mm. long; fruiting spikes 3-6 mm. thick. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .6b. *A. trachycaulum* var. *novae-angliae*

8. Awns nearly equalling or longer than their lemmas.
  11. Body of glumes 6-12 mm. long; awns of lemmas 7-20 mm. long; spikes 3-10 mm. thick........................6c. *A. trachycaulum* var. *glaucum*
  11. Body of glumes 12-18 mm. long; awns of lemmas 1-4 cm. long; spikes 6-13 mm. thick........................6d. *A. trachycaulum* var. *unilaterale*

1. A. CRISTATUM (L.) Gaertn. Crested Wheat-Grass

Dry soil of roadsides and waste places in the southern part of the province. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy "blow-out" in prairie (Scoggan, 1953). Earliest collection seen: Treesbank, 20 miles southeast of Brandon (Criddle, 1939). First report: "Introduced for hay and pasture in the drier parts of the prairie and has become naturalized." [Lowe, 1943].

Eurasian: introduced in the western United States to hold drifting soil, and spreading to adjacent areas.

2. **A. dasystachyum** (Hook.) Scribn.

Dry prairie and sandhills of southwestern Manitoba (not collected east of Delta at the south end of Lake Manitoba). Northernmost collection: Qu'Appelle River mouth near St. Lazare (Macoun & Herriot, 1906). Earliest collection seen: Forrest, north of Brandon (Macoun & Herriot, 1906). First report: Souris Plain, Man. [Macoun, 1888; for discussion of earlier citations, *see* below].

(Subarctic-)temperate western American: s. Yukon and n. Alta. to sw. Man., s. to Calif., Colo., Neb., and n. Ill.

A puzzling citation is that of Bell [1881], who lists the species (as *Triticum dasystachyum*) as having been collected in 1880 at York Factory and "Echimamish River to Oxford House". His plants were determined by Macoun, who included the citations in his Catalogue of Canadian Plants [1888]. Specimens are apparently not in existence at the present time, but it is probable that the Echimamish citation should be referred to *Elymus innovatus*, collected by the writer along the Echimamish-Hayes system as far north as the mouth of Fox River, about 80 miles from York Factory. The York Factory citation is probably referable to *Elymus arenarius* ssp. *mollis*, common along the Hudson Bay coast of the province.

3. **A. smithii** Rydb.

Fertile or sandy prairie and sandhills of southern Manitoba. Northernmost collection: Langruth, 33 miles northwest of Portage la Prairie (A. & D. Löve, 1952). Earliest collection seen: Brandon, bank of Assiniboine River (Macoun, 1896). First report: Souris River, Souris Plain, and Red River [Macoun, 1888; *A. glaucum* var. *occidentale*].

Temperate western American: B.C. to s. Man. and Minn., s. to Calif., Ariz., Tex., Ark., and Tenn.; spreading along railroads to the northeastern states and adjacent Canada, and introduced into s. Alaska.

3a. **A. smithii** var. **molle** (Scribn. & Sm.) Jones

Known in the province only from Winnipeg (Malte, 1918) and Napinka, 40 miles southwest of Brandon (Dore & Lindsay, 1950; growing with the typical form). First report: the present publication.

Range obscure, but present as far north as prairie habitats of Wood Buffalo Park, n. Alberta [Raup, National Museum of Canada, Bull. 74, 1935]. A map of the northern part of the distribution is given by Raup [1930, map 27], to which should be added dots representing the above Manitoba localities.

4. A. REPENS (L.) Beauv. Couch-Grass

Fields, gardens, roadsides, and waste places throughout the southern three-quarters of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, clearing (Gillett, 1948). Earliest collection seen: Emerson (Fowler, 1887; specimen determined by M. L. Fernald). First report: "Oxford House to Knee Lake" [Bell, 1881; as *Triticum repens*]; specimens have not been seen, but the report is undoubtedly correct in view of the importance of the Hayes River system to the fur trade for more than two centuries before this date. It is not unlikely that this aggressive weed was introduced into the province from English ships of the Hudson's Bay Company calling at York Factory, although an earlier citation from Lake of the Woods by Dawson [1875; *Triticum repens*] may have been based on a collection inside Manitoba.

Eurasian: naturalized almost throughout North America, except the northernmost parts (apparently indigenous along the Atlantic coast from Nfld. to Me.).

Forma *aristatum* (Schum.) Holmb., with lemmas definitely awned, has been collected at several localities as far north as Flin Flon.

Forma *trichorrhachis* Rohl., with spike-rachis pilose or hirsute, has been collected at Winnipeg.

4a. A. REPENS var. SUBULATUM (Schreb.) Reichenb.

Known in Manitoba from the following localities: Churchill (Polunin 1934); St. Vital, near Winnipeg (Dore, 1938). Both collections were determined by H. A. Senn. First report: the present publication.

Eurasian: naturalized in eastern North America (apparently indigenous along the Atlantic coast from Nfld. to Conn.).

5. **A. latiglume** (Scribn. & Sm.) Rydb. (*A. violaceum* of auth., not (Hornem.) Lange)

Known in Manitoba from the following localities: Churchill (several collections, the earliest by Macoun in 1910); Mile 474, Hudson Bay Railway, 35 miles south of Churchill, gravel railroad bed (Gillett, 1948). First report: Churchill [Ritchie, 1956; as *Roegneria violacea*].

Arctic American: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), and n. Lab., s. to s. B.C., Colo., and n. Man.; w. and e. Greenland; a map of the greater part of the distribution is given by Raup [1947, pl. XVI].

6. **A. trachycaulum** (Link) Malte (*A. tenerum* Vasey; *A. pauciflorum* (Schwein.) Hitchc., not Schur)

Dry or moist, fertile or sandy prairie, clearings, open woods, and shores almost throughout the province. Northernmost collection: Churchill

(Buller 1939). Earliest collection seen: Winnipeg, prairie and open places (Macoun, 1872). First report: Brandon, Emerson, and Red River [Macoun, 1888; the Red River citation based upon a collection by Douglas in 1827].

Subarctic American: Alaska and Yukon to Great Bear L. and n. Man., s. to Calif., N.M., Kans., and Ill.; e. Que.; Iceland.

6a. **A. trachycaulum** var. **majus** (Vasey) Fern.

Known in Manitoba only from Winnipeg (Denike 1942, dry woods), although there is a specimen collected by Burman in 1901, without locality other than "Manitoba", in the herbarium of the University of Manitoba. First report: the present publication.

(Subarctic-)temperate American: B.C. to Nfld., s. to Nev., Neb., Ont., and N.E.

6b. **A. trachycaulum** var. **novae-angliae** (Scribn.) Fern.

Throughout the province in similar habitats as the typical form. Northernmost collection: Brochet, Reindeer Lake, about lat. 57° 53′ N., sandy bank of lake (Baldwin, 1951). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1857; specimen in Gray Herbarium of Harvard University, determined by M. L. Fernald). First report: Raup [1947, pl. XV; map showing the northern part of the distribution, with a dot for southern Manitoba].

(Subarctic-)temperate American: sw. Mack. and n. B.C. to n. Man., the Great Lakes region, s. Lab., and Nfld., s. to Nev., Neb., Wisc., and Pa.

6c. **A. trachycaulum** var. **glaucum** (Pease & Moore) Malte

Throughout the southern three-quarters of the province, in similar habitats as the typical form. Northernmost collection: Nelson River at Limestone Rapids, about 155 miles south of Churchill, sandy clearing (Scoggan, 1949). Earliest collection seen: Aweme, 20 miles southeast of Brandon (Criddle, 1909). First report: the present publication.

(Subarctic-)temperate American: s. B.C. to n. Man., the Great Lakes region, central Lab., and Nfld., s. to Calif., Neb., and Pa.

6d. **A. trachycaulum** var. **unilaterale** (Cassidy) Malte (*A. richardsoni* Schrad.; *A. subsecundum* (Link) Hitchc.; *A. caninum* of Am. auth., not Beauv.)

Southern Manitoba, in similar habitats as the typical form. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy prairie (Scoggan, 1951). Earliest collection seen: Winnipeg, prairie and open places (Macoun, 1872). First report: Winnipeg and Brandon [Malte, National Museum of Canada, Bull. 68, 1932].

Subarctic American: central Alaska to n. Alta., s. Man., and e. Que., s. to Nev., Colo., S.D., Ill., and N.Y. A map of the greater part of the distribution is given by Raup [1947, pl. XVI].

## 16. LOLIUM L.

### (Darnel)

1. Glume equalling or exceeding the spikelet.
    2. Florets dorsally compressed, 9-10 mm. long; lemmas awned..........1. *L. persicum*
    2. Florets plump, 6-8 mm. long.
        3. Lemmas awned........................................2. *L. temulentum*
        3. Lemmas awnless..........................2a. *L. temulentum* var. *leptochaeton*
1. Glume shorter than the spikelet.
    4. Lemmas about 5-6 mm. long, awnless; culms smooth.................3. *L. perenne*
    4. Lemmas 7-8 mm. long, awnless or awned; culms roughened toward summit.................................................................4. *L. multiflorum*

1. L. PERSICUM Boiss. & Hohen. [*See* Dore, Sci. Agric. 30: 157-164. 1950]. Persian Darnel

Fields and clearings of southern Manitoba. The following specimens have been seen, all determined by Dore: Benito, northwest of Duck Mt. (Murray, 1934); St. Norbert, 9 miles south of Winnipeg, roadside (Groh, 1935); Domain, about 25 miles south of Winnipeg, grassy field (Johnson, 1941); Winnipeg (garden, Johnson, 1935; railroad tracks, Dore, 1950; farm, Denike, 1943, a smooth-culmed form); Reston, 60 miles west-southwest of Brandon, railroad tracks (Dore, 1950); Makaroff, about 125 miles northwest of Brandon, grain fields (Lowe & Van Drecht, 1948). First report: Benito, St. Norbert, and Domain [Groh & Frankton, 1949].

Eurasian: naturalized from central Alta. to Ont., and in N.D. A map of the American distribution is given by Dore [1950, pl. 2].

2. L. TEMULENTUM L.

Only one specimen has been seen: Winnipeg (Burman, 1901; sheet in the herbarium of the University of Manitoba). First report: Dominion City, 10 miles north of Emerson [Jackson *et al.*, 1922].

Eurasian: naturalized in various parts of the United States and adjacent Canada; also known from w. central Alaska and the Dawson area, Yukon.

2a. L. TEMULENTUM var. LEPTOCHAETON R. Br.

Only one specimen has been seen: Winnipeg (Marquardt, 1932). First report: the present publication.

Eurasian: naturalized in various parts of the United States and adjacent Canada.

3. L. PERENNE L. Perennial Rye-Grass

Only one specimen has been seen: Winnipeg, "waste places, escaped" (Burman, 1901). First report: Burman [1910].

European: naturalized in various parts of the United States and adjacent Canada; also known from Alaska.

4. L. MULTIFLORUM Lam. Italian Rye-Grass

The following specimens have been seen, both determined by Dore: Winnipeg (Conners, 1920); Brandon, cultivated land (Stevenson, 1951). First report: Carberry-Macgregor, railroad ballast [Shimek, 1927].

European: naturalized in various parts of the United States and adjacent Canada; also known from Alaska and Yukon.

### 17. HORDEUM L.

(Barley)

1. Awns 2-5 cm. long........................................................1. *H. jubatum*
1. Awns 1·5-3 cm. long..................................1a. *H. jubatum* var. *cespitosum*

1. **H. jubatum** L. Squirrel-tail Grass

Clearings, banks, and waste places almost throughout the province. Northernmost collection: Churchill (several collections, the earliest by Birket-Smith in 1923). Earliest collection seen: Dufferin, open prairie (Burgess, 1873). First report: "Red River Prairie" [Dawson, 1875].

(Arctic-)subarctic American: Alaska and Yukon to Coronation Gulf, s. Keewatin, James Bay, s. Lab., and Nfld., s. throughout most of the U.S.

1a. **H. jubatum** var. **cespitosum** (Scribn.) Hitchc.

The following specimens have been seen: Deloraine (Fletcher, probably 1896, when he collected in the area); North Kildonan, Winnipeg, meadows (Denike, 1940); Brandon, low alkaline soil (Stevenson, 1950). First report: the present publication.

Subarctic western American: Alaska to Man., s. to Calif., Ariz., and Mex.

*H. vulgare* L. (barley), *Triticum aestivum* L. (wheat), and *Secale cereale* L. (rye) are found along roads and railways as waifs, but not established as naturalized elements of our flora.

### 18. ELYMUS L.

(Wild Rye. Lyme-Grass)

1. Creeping rhizomes present.
    2. Spike stiff and erect, pale, up to 30 cm. long, 1-3 cm. thick; spikelets 2-3 cm. long; glumes lanceolate; lemmas awnless; culms arising from among the crowded remains of old leaves; stout and very glaucous plant of the coastal rocks and sandy beaches of Hudson Bay.
        3. Spikes more than 10 cm. long; glumes stiff, with hard, acuminate tips, more or less villous, narrowly lanceolate, generally more than 2 cm. long; culms more than 40 cm. high........................................1. *E. arenarius* ssp. *mollis*
        3. Spikes less than 8 cm. long; glumes soft, densely long-villous, with acute tips, some, at least, broadly lanceolate, 8-14 mm. long; culms less than 40 cm. high..........................................................1a. *E. arenarius* var. *villosissimus*
    2. Spike somewhat curved, greyish to purplish, 5-12 cm. long, little more than 1 cm. thick; spikelets 1-1·5 cm. long; glumes very narrow; lemmas densely purplish-greyish-villous, with an awn mostly 1-4 mm. long; plant slender.............2. *E. innovatus*

1. Creeping rhizomes absent, the plants tufted, slender.
  4. Awns curved and outwardly divergent at maturity; lemmas typically hirsute.
    5. Glumes about 0·5 mm. wide, bristle-like, 1-nerved or nerveless. . .3. *E. interruptus*
    5. Glumes about 1 mm. wide, 3-5-nerved. . . . . . . . . . . . . . . . . . . . . . . .4. *E. canadensis*
  4. Awns ascending, more or less straight; lemmas glabrous or nearly so.
    6. Glumes very narrow and bristle-like, their awns equalling or longer than the body; lemmas with awns 8-10 mm. long; lower spikelets solitary (the upper in normal pairs); leaves 4 mm. wide or less, often involute in drying. . . . . . . . . .5. *E. macounii*
    6. Glumes linear-lanceolate or lanceolate, flat (at least above the base); spikelets all paired; leaves flat.
      7. Glumes strongly indurated at the yellowish, outwardly arching base; leaves 3-13 mm. wide.
        8. Glumes and lemmas awned. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .6. *E. virginicus*
        8. Glumes and lemmas awnless or nearly so. . . .6a. *E. virginicus* var. *submuticus*
      7. Glumes neither indurated nor arched at base, acuminate or short-awned; awn of lemma equalling to twice the length of the body; leaves 4-8 mm. wide. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .7. *E. glaucus*

1. **E. arenarius** L. subsp. **mollis** (Trin.) Hult. (var. *villosus* Mey.) Sea Lyme-Grass

Saline shores of Hudson Bay. Specimens have been seen from the following localities: Churchill (many collections, the first by Macoun in 1910); York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949). First report: Churchill and York Factory [Macoun, 1888].

Arctic American: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Banks I.), n. Que., n. Lab., and Nfld., s. along the coasts to Calif. and Mass.; shores of L. Michigan and L. Superior; Greenland; Iceland; e. Asia; with the main form, arctic circumpolar. A map of the greater part of the area (to which the Manitoba stations should be added) is given by Raup [1930, map 36].

*E. dasystáchys* Trin. is reported by Bell [1880; as E. *dasystachyum*] from "Nelson River between Lake Winnipeg and the coast of Hudson's Bay". His plants were determined by Macoun, who included this citation in his Catalogue of Canadian Plants [1888]. The specimen has not been seen, but the report is undoubtedly referable to the above species, treated by Hooker [1840] as identical with *E. dastachys*. The latter, however, is now recognized as a distinct eastern Asiatic species.

1a. **E. arenarius** var. **villosissimus** (Scribn.) Polunin

Known only from Churchill, where it was collected by Dore in 1949 on cobble pavement inside the old Fort Prince of Wales. First report: the present publication.

Essentially the range of ssp. *mollis*, with which it tends to intergrade. [*See* Hultén, 1941, p. 270].

2. **E. innovatus** Beal

Open woods and rocky or sandy soil almost throughout the province except south of Riding Mountain. Northernmost collection: Churchill (Simpson, 1942; Beckett, 1953). Earliest collection seen: Duck Mountain (Halliday, 1930). First report: Lowe [1943].

(Arctic-)subarctic western American: interior Alaska and n. coast of Mack. to n. Alta. and nw. Ont., s. to B.C., Mont., Wyo., and S.D.; an isolated station on the west coast of James Bay. A map of the greater part of the distribution, to which Manitoba stations should be added, is given by Raup [1930, map 18].

3. **E. interruptus** Buckl. (*E. diversiglumis* Scribn. & Ball)

Known in Manitoba only from Riding Mountain, where it was collected in 1932 by Halliday. The specimen is in the National Herbarium of Canada. First report: the present publication.

Temperate American: Mont., s. Man., and Mich., s. to N.M., Tex., Ark., and Tenn. *E. interruptus* of recent authors, in part, not Buckley, has been concluded by Booher & Tryon [Rhodora 50: 88-90. 1948] to be a hybrid between *Elymus canadensis* and *Hystrix patula.* The latter parent, however, does not occur in Manitoba, and our plant is probably true *E. interruptus.*

4. **E. canadensis** L. Canada Wild Rye

Dry sandy, gravelly, or rocky soil in the southern part of the province. Northernmost collection: Grand Beach, near the south end of Lake Winnipeg (Lowe, 1919; sand dunes, Breitung, 1949). Earliest collection seen: Lake Winnipeg (Richardson; specimen undated, but presumably collected during Franklin's explorations of 1819-22) (the earliest dated specimen seen is one collected by Macoun in 1872 on the banks of the Assiniboine River). First report: Turtle Mountain, thicket [Dawson, 1875].

(Subarctic-)temperate American: s. Alaska to Great Slave L., s. Man., James Bay (isolated station), the Great Lakes region, and N.B.

Forma *glaucifolius* (Muhl.) Fern., with lemmas glabrous or merely scabrous, has been collected at Winnipeg, Victoria Beach, Brandon, Woodside (25 miles northwest of Portage la Prairie), and Wawanesa (10 miles southeast of Brandon).

5. **E. macounii** Vasey

Prairie, clearings, and shores throughout the province. Northernmost collection: Brochet, Reindeer Lake, lat. 57° 53′ N., sandy lake bank (Baldwin, 1951). Earliest collection seen: Oak Point, near the south end of Lake Manitoba (Macoun, 1872). Other specimens seen: Brandon (several collections, the first by Malte in 1911); Aweme (Criddle, 1927); Eriksdale (Bergsteinson, 1929); Winnipeg (Higham, 1940; Denike, 1943); St. Jean Baptiste, south of Winnipeg (Dore, 1948); Cross Lake, northeast of Lake Winnipeg (Scoggan, 1948); Dawson Bay, Lake Winnipegosis, saline flats (Rowe, 1949); The Pas (Krivda, 1953). First report: Warren Landing [Lowe, 1920].

Subarctic western American: central Alaska and central Yukon to n. B.C. and n. Man., s. to Calif., N.M., Kans., Ia., and Minn. According to Booher & Tryon [Rhodora 50: 90. 1948], this species is a hybrid of *Agropyron trachycaulum* and *Hordeum jubatum.*

6. **E. virginicus** L. Terrell Grass

Open woods, thickets, and shores of southern Manitoba. Northernmost collection seen: Riding Mountain, aspen woods (Rowe, 1948). The species is reported as far north as Flin Flon by Lowe (1943), but there is apparently no supporting specimen from that locality. Earliest collection seen: near Fort Garry (Macoun, 1872). First report: Emerson and Roseau River [Macoun, 1888].

(Subarctic-)temperate American: Alta. to w. Nfld., s. to Wash., Ariz., Tex., and Fla.

Forma *hirsutiglumis* (Scribn.) Fern. (var. *intermedius* (Vasey) Bush), with lemmas and glumes villous-hirsute, has been found along Red River (Denike, 1940) and on a sandy beach of Lake Manitoba at Delta (Dore, 1950).

6a. **E. virginicus** var. **submuticus** Hook. (*E. curvatus* Piper)

Habitats and distribution of the typical form in the province. Northernmost collection: Riding Mountain, edge of creek (Scoggan, 1953). Earliest collection seen: Winnipeg, banks of Red River (Macoun, 1896). First report: "Not uncommon along the Assiniboine and Qu'Appelle Rivers, Man." [Macoun, 1888].

Temperate American: Wash. to s. Man. and e. Que., s. to Okla. and Ky.

An apparent hybrid between *E. virginicus* and *E. canadensis* was collected at Winnipeg in 1911 by Malte. Specimens are in the National Herbarium of Canada.

7. **E. glaucus** Buckl. (*E. americanus* Vasey & Scribn.)

Thickets and shores of southern Manitoba. The following specimens have been seen: Oak Point, near the south end of Lake Manitoba (Macoun, 1872); Deloraine, 60 miles southwest of Brandon (Fletcher, specimen undated, but probably collected in 1896 with dated collections of other species); "West of Manitoba" (Macoun, 1872; presumably the western part of Manitoba). First report: Emerson and Winnipeg [Macoun, 1888; as *E. americanus*].

(Subarctic-)temperate American: southernmost Alaska, w. central Yukon, and B.C. to Lake Superior, Ont., s. to Calif., Ark., Mich., and N.Y.

*E. junceus* Fisch., Russian Wild Rye, was collected by Stevenson in 1952 on wasteland at Brandon, where it had escaped from cultivation. It can scarcely be said to be naturalized in the province.

### 19. KOELERIA Pers.

1. **K. cristata** (L.) Pers. June Grass

Dry prairie and clearings throughout the southern three-quarters of Manitoba (introduced northward). Northernmost collection: Nelson River at Limestone Rapids, about 150 miles south of Churchill, railroad clearing (Scoggan, 1949). Earliest collection seen: Oak Point, near the south end of Lake Manitoba (Macoun, 1872). First report: Emerson and Brandon [Macoun, 1888].

Temperate circumpolar: B.C. to Que., s. to Calif., La., Ill., and Pa.; Eurasia.

### 20. SPHENOPHOLIS Scribn.

(Wedge-Grass)

1. Panicle dense, usually spike-like, erect or nearly so, the spikelets (2·5-3 mm. long) densely crowded on the short appressed branches; upper glume rounded and somewhat hooded at summit, as wide as long, with firm margins .......................... 1. *S. obtusata*

1. Panicle open and somewhat lax, often nodding, the spikelets (3-4·2 mm. long) not hiding the branches; upper glume acute or subacute, not hooded at apex, at least twice as long as wide, with thinner margins............................2. *S. intermedia*

1. **S. obtusata** (Michx.) Scribn. (Incl. var. *lobata* (Trin.) Scribn.)

Prairie, thickets, and clearings of southern Manitoba. Northernmost collection: Ochre River, south of Dauphin Lake, prairie (Scoggan, 1953). Earliest collection seen: Brandon, boggy places (Macoun, 1896). First report: Red River [Macoun, 1888; as *Eatonia obtusata*].

Temperate American: B.C. to s. Ont. and Me., s. to Calif., n. Mex., and Fla.

2. **S. intermedia** Rydb. (*S. pallens* of Am. auth., not *Aira pallens* Biehler)

Meadows, shores, and clearings throughout the southern two-thirds of the province. Northernmost collection: Hayes River at the mouth of Fox River, about 80 miles from York Factory, clay-gravel beach (Scoggan, 1949). Earliest collection seen: Washow Bay, Lake Winnipeg (Macoun, 1884). First report: Lowe [1943]; earlier reports of *S. nitida* (*Eatonia pensylvanica*) and *S. pallens* are referable to this species.

(Subarctic-)temperate American: Tanana Hot Springs, central Alaska; n. Alta. and n. Man. to James Bay and Nfld., s. to Ariz., Tex., and Fla.

## 21. TRISETUM L.

1. Upper glume 4-5 mm. long, acute to short-pointed; panicle 2-6·5 cm. long, green, bronze, or purple, very dense except at base....................1. *T. spicatum* var. *maidenii*
1. Upper glume 4·5-6·5 mm. long, more sharply pointed; panicle 2·5-12 cm. long, silvery-green, becoming whitish-brown, interrupted...............1a. *T. spicatum* var. *molle*

1. **T. spicatum** (L.) Richter var. **maidenii** (Gand.) Fern.

Specimens have been seen from the following localities: Churchill (several collections, the first by Bell in 1884, crevices of rocks); York Factory, gravel beach of Hay Island (Scoggan, 1949); Hayes River near Swampy Lake, about 120 miles from York Factory, rock outcrop (Scoggan, 1949). First report: Churchill, rocky places by shore [Gardner, 1937].

Arctic ?circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to Ellesmereland), n. Que., n. Lab., and Nfld., s. to B.C. and e. Que.; Spitsbergen; n. Europe; the main form also in Greenland and Asia. A map of the northern part of the American distribution of the collective species is given by Raup [1947, pl. XVI]. True *T. spicatum*, with very dense spike, glumes acute or only very short-awned, lemmas only 3-4 mm. long [*see* Fernald, Rhodora 18:195-198.1916], is apparently not present in Manitoba.

1a. **T. spicatum** var. **molle** (Michx.) Beal

Specimens have been seen from the following localities: Churchill (several collections, the first by Gardner in 1930); Hayes River at the mouth of Fox River, clay-gravel beach (Scoggan, 1949); Knee Lake, clearing (Scoggan, 1949); Nelson River opposite Gillam Island, gravel beach

(Scoggan, 1949); Cross Lake, northeast of Lake Winnipeg, rock outcrop (Scoggan, 1949); Gillam, about 165 miles south of Churchill, dry woods (Schofield, 1950); Cochrane River, lat. 58° 33′ N., sandy portage through jack-pine forest (Baldwin, 1951). First report: York Factory [Macoun, 1888].

(Arctic-)subarctic American: Yukon to central Keewatin, n. Que., n. Lab., and Nfld., s. to Calif., Colo., Minn., Pa., and N.C.

### 22. AVENA L.

(Oat)

1. A. FATUA L. Wild Oat

Fields and waste places in the southern half of the province. Northernmost collection: Grand Rapids, clearing on limestone substratum (Scoggan, 1948). Earliest collection seen: Portage la Prairie (McMorine, 1894). First report: between Carberry and Macgregor, east of Brandon [Shimek, 1927].

Eurasian: naturalized in North America from Alaska, Yukon, and B.C. to Nfld., s. to Mex.

Forma *glabrata* Peterm., with glabrous lemmas, has been collected at High Bluff, near Portage la Prairie (Hargrave, 1882); Killarney, near Turtle Mountain (Macoun, 1896); Brandon (Macoun, 1897); and St. Charles, near Winnipeg (unknown collector, 1949).

*A. sativa* L., the cultivated oat, occurs commonly as an escape, but is not persistent.

### 23. HELICTOTRICHON Bess.

1. **H. hookeri** (Scribn.) Henr. (*Avena hookeri* Scribn.; *A. americana* Scribn.) Spike Oat

Dry slopes and prairie throughout southern Manitoba. Northernmost collection: Riding Mountain, sandy soil of grassy hillside (Rowe, 1948). Earliest collection seen: Dufferin, southwest of Winnipeg (Burgess, 1873). First report: "Abundant on the prairie, from Portage la Prairie westward..." [Macoun, 1888; as *Avena pratensis* var. *americana*].

(Subarctic-)temperate western American: s. Yukon and n. Alta. to s. Man. and Minn., s. to N.M.

### 24. DESCHAMPSIA Beauv.

(Hairgrass)

1. Glumes acuminate, much exceeding the florets; awn inserted about middle of lemma, bent, 3-4 mm. long; panicle 4-10 cm. long, the few, flexuous, spreading branches smooth; leaves flat, soft, not markedly tufted............................1. *D. atropurpurea*

1. Glumes acute or blunt, shorter than to barely exceeding the upper floret; awn inserted near base of lemma, straight or slightly bent, usually shorter than lemma, deciduous; panicle 2-45 cm. long, its slender, spreading branches scabrous; leaves rigid, flat or involute, mostly in basal tufts.

    2. Spikelets averaging 2-4 mm. in length..............................1. *D. cespitosa*
    2. Spikelets averaging 4-6 mm. in length................2a. *D. cespitosa* var. *littoralis*

1. **D. atropurpurea** (Wahl.) Scheele (*Vahlodea atropurpurea* (Wahl.) Fries)

Specimens have apparently been collected from only the following locality: Baralzon Lake, lat. 60° N., dry rocky arctic tundra (Scoggan & Baldwin, 1950). First report: "In moist places, northern Manitoba to Eskimo Point, N.W.T." [Lowe, 1943].

(Arctic-)subarctic circumpolar (including subspecific entities): Alaska and Yukon to s. Keewatin, Hudson Str., and n. Lab. (a doubtful report for Somerset I.), s. to Oreg., and n. N.E.; s. Greenland; n. Eurasia.

2. **D. cespitosa** (L.) Beauv. (Incl. var. *glauca* (Hartm.) Lindm. f.) Tufted Hairgrass

Shores and dry or moist prairie and clearings throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1857; specimen in the Gray Herbarium of Harvard University). First report: "Oxford House to Knee Lake" [Bell, 1881; as *Aira caespitosa*]. The writer has derived little satisfaction from an attempt to segregate the Manitoba material into the typical form and var. *glauca* on the basis of such intergrading characters as length of culms, leaves, and panicles. Hultén [1942] notes that "Samuelsson considers the Swedish var. *glauca* to be merely a shore form of the common *D. caespitosa*".

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack., s. Baffin, n. Lab., and Nfld., s. to Calif., N.M., S.D., Ill., and N.C.; sw. Greenland (introd.); Iceland; n. Eurasia.

2a. **D. cespitosa** var. **littoralis** (Reut.) Richter

Known in the province only from the following collections: Churchill (several collections, the first by Polunin in 1936); York Factory, gravel beaches and clearings (Scoggan, 1949). First report: Churchill [Ritchie, 1956].

Northern part of the range.

### 25. Danthonia DC.

(Wild Oat-Grass)

1. **D. spicata** (L.) Beauv. (Incl. var. *pinetorum* Piper) Poverty-Grass

Sterile sandy or rocky soil and thin woodland in the southern half of the province. Northernmost collection seen: Norway House (Jackson, 1925). Earliest collection seen: "Lake of the Woods, Man.", dry rocky soil (Dawson, 1873). First report: Red Deer River, lat. 53° [Macoun, 1888]. Basis of reports of *D. intermedia* Vasey from Manitoba.

(Subarctic-)temperate American: southernmost Alaska and Lake Athabasca to central Man., James Bay, and Nfld., s. to Oreg., N.M., Tex., and Fla.

Most or all of our Manitoba material appears to be intermediate between the typical form and the scarcely distinct var. *pinetorum* Piper (*D. thermalis* Scribn.) [*see* Butters & Abbe, Rhodora 55:122-124. 1953].

## 26. Oryzopsis Michx.

## (Mountain-Rice)

1. Panicle diffuse, the branches forking regularly in pairs; glumes tipped with a sharp firm point, much exceeding the long-bearded lemma, the latter with an awn 4-6 mm. long; leaves linear-filiform, involute; culms densely tufted.................1. *O. hymenoides*
1. Panicle with erect to spreading branches, not diffuse; glumes blunt to soft-pointed.
    2. Lemmas glabrous, 2-2·5 mm. long, the awn 5-10 mm. long; glumes acuminate, 3-4 mm. long; leaves flat or involute, 0·5-2 mm. wide..................2. *O. micrantha*
    2. Lemmas pubescent.
        3. Leaves involute-filiform, the basal ones short; spikelets 3-4 mm. long; awn of lemma 0·5-2 mm. long.............................................3. *O. pungens*
        3. Leaves 4-10 mm. wide, evergreen; spikelets 6-8 mm. long; awn of lemma 5-10 mm. long..................................................4. *O. asperifolia*

1. **O. hymenoides** (R. & S.) Ricker (*Eriocoma cuspidata* Nutt.) Silkgrass. Indian Millet

Dry prairie and sandhills of southwestern Manitoba. Northernmost collection: St Lazare at the mouth of Qu'Appelle River, about 75 miles northwest of Brandon, sandhills (several collections, the first by Macoun in 1906). Earliest collection seen: Fort Ellice, near St. Lazare (Macoun, 1872). First report: Burman [1910; as *O. cuspidata*].

Temperate western American: se. B.C. and central Alta. to sw. Man., s. to Calif. and Tex.

2. **O. micrantha** (Trin. & Rupr.) Thurb. Littleseed Ricegrass

Known in Manitoba only from the following localities: Onah, about 20 miles east of Brandon (Criddle, 1927); Shilo, 12 miles east of Brandon, open sand (Frankton, 1949); Routledge, about 40 miles west of Brandon, sandhills (Scoggan, 1953). First report: the present publication.

Temperate western American: Mont. to sw. Man., s. to Calif. and N.M.

3. **O. pungens** (Torr.) Hitchc.

Sterile sandy soil, rock outcrops, and light woodland throughout the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, sandy jack-pine woods (Schofield, 1950). Earliest collection seen: Sewell (now Camp Hughes) near Brandon, sandy soil (Macoun, 1896). First report: Gypsumville, about 125 miles north of Portage la Prairie [Lowe, 1943; including the report of *O. canadensis* from se. Man.].

Subarctic American: n. B.C. to Great Bear L., n. Man., and n. Que., s. to Colo., S.D., Ind., and Pa.

4. **O. asperifolia** Michx.

Sterile sandy soil and light dry woodland throughout the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railroad bank (Schofield, 1950). Earliest collection seen: Otterburn, about 30 miles south of Winnipeg (Macoun, 1896). First report: Jackson *et al.* [1922].

(Subarctic-)temperate American: central B.C. and n. Alta. to Nfld., s. to Utah, N.M., S.D., and w. Va.

### *Milium* L.

*M. effusum* L. (Millett-Grass) is reported by Lowe [1943] from "Victoria Beach and east to Ontario". Supporting specimens have not been seen, however, and the species must be excluded from our flora for the present.

## 27. STIPA L.

(Speargrass. Needlegrass)

[*See* Hitchcock, 1925.]

1. Glumes 1·5-5 cm. long; lemmas 8-25 mm. long; branches of the narrow panicle erect or somewhat ascending; summit of leaf-sheath not bearded.
  2. Glumes 2-5 cm. long, short-awned; lemmas 12-25 mm. long, dark brown at maturity; grain 2-3 cm. long; panicle exserted at maturity.
    3. Glumes 3-5 cm. long; lemmas 16-25 mm. long, their awns 12-20 cm. long.......... 1. *S. spartea*
    3. Glumes 2-3 cm. long; lemmas 12-15 mm. long, their awns not more than 7 or 8 cm. long.......... 1a. *S. spartea* var. *curtiseta*
  2. Glumes 1·5-2(-2·8) cm. long, the upper half awn-like and fragile; lemmas 8-12 mm. long, whitish or light brown at maturity, their awns 10-15 cm. long; grain 1-1·5 cm. long; upper leaf-sheaths often enclosing the base of the panicle.......... 2. *S. comata*
1. Glumes 5-10 mm. long; lemmas 5-6 mm. long, brownish at maturity, their awns 2-4 cm. long.
  4. Panicle narrow, its branches erect; summit of leaf-sheaths long-bearded with white hairs.......... 3. *S. viridula*
  4. Panicle open, its branches spreading or drooping; summit of leaf-sheaths glabrous.......... 4. *S. richardsonii*

1. **S. spartea** Trin. Porcupine-Grass

Dry prairie habitats and light sandy woodland of southern Manitoba. Northernmost collection: Duck Mountain, south edge, prairie opening in mixed woods (Rowe, 1950). Earliest collection seen: "Manitoba plains" (Macoun, 1872); but an 1826 collection by Douglas from Red River is cited by Macoun [1888]. First report: Carberry, drier portions of prairie, abundant [Christy, 1887].

Temperate American: B.C. to Ont., s. to N.M., Okla., and Pa.

1a. **S. spartea** var. **curtiseta** Hitchc.

Known in the province as far north as Riding Mountain (Rowe, 1948, grassy south-facing slope). Earliest collection seen: Cypress River, 40 miles southeast of Brandon (Denike, 1897). First report: Birtle, 60 miles northwest of Brandon [Hitchcock, Contrib. U.S. Nat. Herb. 24: 230.1931].

Temperate western American: Alta. to s. Man., s. to Wyo. and S.D.

2. **S. comata** Trin. & Rupr.

Dry prairie habitats of southern Manitoba. Northernmost collection seen: St. Lazare, 70 miles northwest of Brandon, sandy slope (Dore & Boivin, 1951). Earliest collection seen: Brandon, open prairie (Macoun, 1896). First report: Fort Ellice, near St. Lazare [Christy, 1887].

(Subarctic-)temperate western American: central B.C. and n. Alta. to s. Man. and Mich., s. to Calif., Tex., Ia., and Ind.; introduced further eastward and in s. Yukon. A map of part of the distribution is given by Raup [1930, map 17].

3. **S. viridula** Trin. Feather-Bunchgrass

Dry prairie habitats of southern Manitoba. Northernmost collection: Rossburn, about 70 miles north-northwest of Brandon, prairie opening in aspen parkland (Scoggan, 1951). Earliest collection seen: Portage la Prairie (McMorine, 1894). First report: Macoun [1888].

Temperate western American: B.C. to Man., s. to Ariz., Ia., and Ill.; introduced further eastward.

4. **S. richardsonii** Link

Known in Manitoba only from Riding Mountain, where it was collected in natural prairie openings of mixed woods by Rowe in 1948. First report: the present publication.

Temperate western American: B.C. to w. Man., s. to Ia. and Colo.

### 28. ARISTIDA L.

(Triple-awned Grass)

1. **A. longiseta** Steud.

Specimens have been seen from Aweme and Treesbank, about 20 miles southeast of Brandon, where they were collected by Criddle in 1931. First report: the present publication.

Temperate western American: B.C. to sw. Man., s. to Ariz., Tex., and n. Mex.

*A. basiramea* Engelm., an annual plant with middle awn of lemmas spirally coiled at base, has been reported by Macoun [1888], Shimek [1927], and Lowe [1943] from southwestern Manitoba. No specimens have been seen, however, and the species must be excluded from our flora for the present.

### 29. CINNA L.

(Wood Reedgrass)

1. **C. latifolia** (Trev.) Griseb.

Moist woods, thickets, and clearings throughout the southern half of the province. Northernmost collection: Flin Flon, rock outcrop (Scoggan, 1951). Earliest collection seen: Loon Strait, near The Narrows, Lake Winnipeg, wet places (Macoun, 1884). First report: Burman [1910; as *C. pendula*].

(Subarctic-)temperate circumpolar: s. Alaska and s. Mack. to central Man., s. Lab., and Nfld., s. to Calif., n. N.M., Tenn., and N.C.; Eurasia.

## 30. MUHLENBERGIA Schreb.

1. Panicle open and diffuse, ovoid, its divergent branches capillary; spikelets scattered, long-pedicelled, 1·5 mm. long, purplish; leaves short, firm and harsh, crowded with overlapping sheaths in 2 vertical rows ................................ 1. *M. asperifolia*
1. Panicle contracted, narrowly linear to subcylindric; spikelets sessile to very short-pedicelled, appressed-ascending, often closely overlapping.
  2. Panicles narrowly linear and stiff; lemmas glabrous or minutely and evenly pubescent; leaves 1-2 mm. wide, involute; culms slender and wiry.
    3. Glumes ovate, less than half as long as the spikelets; plant perennial by creeping rhizomes ................................ 2. *M. richardsonis*
    3. Glumes acuminate-cuspidate, about two-thirds as long as the spikelets; plant perennial by hard, bulb-like, scaly bases ........................ 3. *M. cuspidata*
  2. Panicles lanceolate to oblong-cylindric; lemmas pubescent, the hairs toward the base longer than those above; glumes about equalling to much exceeding the lemmas; leaves flat, 2-8 mm. wide; scaly rhizomes present.
    4. Glumes awnless or awn-tipped, about equalling the lemmas, green or purple; anthers 0·3-0·4 mm. long; internodes of culm puberulent below the glabrous nodes ................................ 4. *M. mexicana*
    4. Glumes awn-tipped, much longer than the lemmas.
      5. Culms usually with several stiffly erect branches from the middle nodes, the internodes glabrous and shining; leaf-sheaths keeled; ligule conspicuous; anthers 0·5-0·8 mm. long; grain 1·8-2·2 mm. long .................... 5. *M. racemosa*
      5. Culms simple, rarely with erect basal branches, the internodes puberulent nearly to base; leaf-sheaths hardly keeled; ligule short, usually hidden; anthers 1-1·5 mm. long; grain 1·2-1·5 mm. long ............. 6. *M. glomerata* var. *cinnoides*

1. **M. asperifolia** (Nees & Mey.) Parodi (*Sporobolus asperifolius* Nees & Mey.) Scratchgrass

Moist, often alkaline, soils of southern Manitoba. Northernmost collection: Vista, 60 miles northwest of Brandon, pasture (Scoggan, 1951). Earliest collection seen: Winnipeg (Malte, 1912). First report: West Kildonan, Winnipeg [Jackson *et al.*, 1922].

Temperate western American: B.C. to s. Man., s. to Calif, and Tex.

2. **M. richardsonis** (Trin.) Rydb. (Incl. the doubtfully distinct *M. squarrosa* (Trin.) Rydb.)

Dry or moist, often alkaline, soils of southern Manitoba. Northernmost collection: Birds Hill, near Winnipeg, dry bog (Denike, 1941). Earliest collection seen: Brandon (Malte, 1911). First report: Macoun [1888; as *Sporobolus depauperatus* Scribn.]; this is presumably the basis for the inclusion by Lowe [1943] of *Muhlenbergia depauperata* Scribn. in his checklist, but the two names are not synonymous, and the latter, a species of the southern U.S. and Mexico, must be excluded from our flora.

Subarctic American: s. Yukon and Great Bear L. to central Sask., s. Man., James Bay, and e. Que., s. to Calif., N.M., Neb., Minn., and Me. A map of the northern part of the distribution is given by Raup [1930, map 31], to which should be added stations in s. Yukon and s. Man. and on James Bay.

3. **M. cuspidata** (Nutt.) Rydb. (*M. brevifolia* (Nutt.) Jones, not Scribn.)

Dry or moist prairie and clearings throughout the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground (Scoggan, 1948). Earliest collection seen: "West of Manitoba" (Macoun, 1872; presumably the western part of Manitoba). First report: Macoun [1888; as *Sporobolus cuspidatus*].

Temperate American: Alta. to s. Man. and Mich., s. to N.M., Okla., Mo., and Ky.

4. **M. mexicana** (L.) Trin.

Damp soils and light woodland of southern Manitoba. Northernmost collection: Bellhampton, about 75 miles northeast of Brandon (Bolton, 1937). Earliest collection seen: Elm Park, Winnipeg (Macoun, 1896). First report: Winnipeg [Jackson *et al.*, 1922].

Temperate American: s. B.C. to e. Que., s. to n. Calif., N.M., Kans., O., and N.C.

Forma *setiglumis* (S. Wats.) Fern., with awned glumes, has been collected at Winnipeg (Denike, 1942; specimen determined by Dore).

5. **M. racemosa** (Michx.) BSP.

Dry or moist open soil, clearings, and woodland of southern Manitoba. Northernmost collection: Dauphin, north of Riding Mountain (Groh, 1921). Earliest collection seen: Lake Winnipeg (Richardson, undated but presumably taken during 1819-22; the earliest dated specimen is that of Macoun, collected at Brandon in 1896). First report: Jackson *et al.* [1922; *M. glomerata* being erroneously given as a synonym]. *M. sylvatica*, tentatively included by Lowe [1943] in his checklist, is probably referable here.

Temperate American: Wash., Sask., s. Man., and Mich., s. to Ariz., N.M., Okla., and Ind.

6. **M. glomerata** (Willd.) Trin. var. **cinnoides** (Link) Hermann

Dry to swampy open ground, thickets, and light woodland throughout the southern half of the province. Northernmost collection: 40 miles north of Lake Winnipeg on Hargrave River near Hill Lake, sand ridge (Scoggan, 1948). Earliest collection seen: Virden and Dauphin (Groh, 1922). First report: the present publication; the listing of the main form by Burman [1910] is undoubtedly referable to this entity, as is also its citation by Macoun [1888] as frequent throughout the prairie region.

(Subarctic-)temperate American: Alta. to Nfld., s. to Nev., Wyo., Minn., and Pa. The typical form (*M. setosa* (Biehler) Trin., not (HBK.) Kunth) is an eastern American plant.

## 31. ALOPECURUS L.

(Foxtail)

1. Spikelets 2-2·5 mm. long; awn attached near middle of lemma, hidden by the glumes or exserted 1-2 mm.; anthers 0·6-1 mm. long; panicle slender, 2·5-8 cm. long, 3-5·5 mm. thick; plant of shallow water and wet places........................1. *A. aequalis*

1. Spikelets about 5 mm. long; awn attached below middle of lemma, usually exserted about 5 mm.; anthers 2·5-3 mm. long; panicle 3-12 cm. long, 6-10 mm. thick; plant of damp habitats........................2. *A. pratensis*

1. **A. aequalis** Sobol. (*A. geniculatus* L. var. *aristulatus* Torr.)

Marshy or muddy ground, shores, and shallow water throughout the southern three-quarters of the province. Northernmost collection seen: Reindeer Lake, lat. 57° 48′ N., sandy beach (Baldwin, 1951); reported by Bell [1880] from Churchill River. Earliest collection seen: Dawson Road, s. Man., damp open prairie (Dawson, 1873) (but an 1826 Douglas collection is reported by Macoun [1888] from Red River). First report: the foregoing Bell citation.

Subarctic circumpolar: central Alaska and central Yukon to Great Bear L., n. Man., n. Lab., and Nfld., s. to Calif., N.M., Kans., and Md.; southern half of Greenland; Iceland; Eurasia.

*A. geniculatus* L., with awn attached toward base of lemma and exserted 2-4 mm. beyond the spikelet, is cited by Lowe [1943] as "Common around south end of Lake Winnipeg, also at L. Killarney and L. Brereton". All material seen, however, is referable to the foregoing species.

2. A. PRATENSIS L. Meadow-Foxtail

Only one specimen has been seen: Brandon, edge of fields (Stevenson, 1950). First report: Warren Landing [Lowe, 1920].

Eurasian: widely naturalized in North America.

*A. alpinus* Sm. is reported by Rae [1850] as being collected between Churchill and Repulse Bay, and by Macoun [1888] from between Severn and York Factory. No supporting specimen of the former citation has been seen, but it is probable that the collection was made north of the sixtieth parallel. The latter citation is based upon a collection of J. M. Macoun in 1886, with the annotation "West coast of Hudson Bay", probably collected in the Severn area of northern Ontario. This, and a collection from Cape Eskimo, lat. 61° 05′ N., are the closest ones to our area seen, and, although the species will probably prove to occur on the Hudson Bay coast of the province, it must be excluded for the present. The citation "Garry and N.W. Angle Road" by Dawson [1875] is undoubtedly referable to *A. aequalis.*

## 32. PHLEUM L.

(Timothy)

1. P. PRATENSE L.

Commonly cultivated and escaped to fields, roadsides, and clearings almost throughout the province. Northernmost collection: Churchill (Polunin, 1934). Earliest collection seen: Red River (Douglas; specimen undated, but presumably collected in 1826. The earliest dated collection seen is from Fort Ellice, about 70 miles northwest of Brandon, where it was collected by Macoun in 1879). First report: Burman [1910].

Eurasian: widely naturalized in North America.

### 33. Polypogon Desf.

(Beardgrass)

1. P. monspeliensis (L.) Desf.

Specimens have been seen from the following localities: Portage la Prairie, in sand (Denike, 1940); Delta, near the south end of Lake Manitoba (Peturson & Johnson, low meadow, 1934; Denike, marsh, 1939; Dore, moist sandy roadway, 1950); Moosehorn, 90 miles north of Portage la Prairie (Friesen, 1941). First report: Delta [Senn, Can. Field-Nat. 55:17. 1941].

European: widely naturalized in North and South America.

### 34. Sporobolus R. Br.

(Drop-seed)

1. Leaf-sheaths with a conspicuous tuft of long white hairs at summit; spikelets 2-2·5 mm. long; panicles ovoid to pyramidal, lead-coloured, exserted or included at base in the upper leaf-sheaths........................................1. *S. cryptandrus*
1. Leaf-sheaths not bearded at summit.
  2. Spikelets 2-3 mm. long; grain 1-1·5 mm. long; panicles greenish or purplish, narrow, often entirely hidden in the swollen leaf-sheaths; tufted annual plant...2. *S. neglectus*
  2. Spikelets 4·5-6 mm. long; grain 2 mm. long: panicle purplish or blackish, open, becoming long-exserted; tufted perennial plant....................3. *S. heterolepis*

1. **S. cryptandrus** (Torr.) Gray Sand-Drop-seed

Dry prairie and sandhills of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, prairie sandhills (Scoggan, 1951). Earliest collection seen: Grand Beach, near the south end of Lake Winnipeg (Malte, 1918). First report: Carberry and Macgregor, east of Brandon, fertile and sandy prairie [Shimek, 1927].

Temperate American: Wash. to Alta., s. Man., w. Que., and N.E., s. to Calif., La., and N.C.

A specimen from Brandon (dry soil along railroad tracks, Stevenson, 1950) has been determined by Dore as ssp. *fuscicolus* (Hook.) Jones & Fassett [*see* Rhodora 52: 125-126. 1950].

2. **S. neglectus** Nash

Specimens have been seen from the following localities: Morris, railroad track (Macoun, 1896); Aweme, about 20 miles southeast of Brandon (Criddle, 1926); Baldur, about 35 miles southeast of Brandon, moist alkaline prairie (Lowe, 1941); Winnipeg, fields (Lowe, 1944); Poplar Point, about 35 miles west of Winnipeg, gravel on highway bridge (Dore, 1950). First report: Winnipeg, street [Jackson *et al.*, 1922].

Temperate American: Wash. to s. Man. and N.B., s. (with large gaps in the West) to Ariz., Tex., La., and Va.

3. **S. heterolepis** Gray Prairie Drop-seed

Dry or moist prairie, sandhills, and clearings of southern Manitoba. Northernmost collection: Woodroyd, west of Selkirk (Watts, 1894).

Earliest collection seen: the foregoing Woodroyd specimen. First report: "very common in north-western Manitoba" (before the extension of the province to include a large section of the Northwest Territories as then delimited) [Macoun, 1888].

Temperate American: Sask. to w. Que., s. to Wyo., Tex., O., and N.Y.

## 35. AGROSTIS L.

## (Bentgrass)

[*See* Malte, 1928.]

1. Palea present, little shorter than the awnless lemma; spikelets 2-3·5 mm. long; creeping stolons present.
    2. Culms up to 1 m. tall, scarcely decumbent at base; leaves mostly 5-8 mm. wide; panicle ovoid, its branches (up to 10 cm. long) ascending to wide-spreading.................................................1. *A. stolonifera* var. *major*
    2. Culms mostly not much more than 4 dm. long, decumbent at base; leaves mostly less than 5 mm. wide; panicle compact, its branches (at most 4 cm. long) appressed or closely ascending....................................1a. *A. stolonifera* var. *compacta*
1. Palea obsolete or nearly so; spikelets 2-3 mm. long; panicle open in maturity; creeping stolons absent.
    3. Panicle purple to green, very diffuse, 5-40 cm. long, its conspicuously scabrous, capillary, flexuous branches spikelet-bearing chiefly above the middle, finally gibbous at base; lemmas awnless; common plant of sterile soil..........................2. *A. scabra*
    3. Panicle usually purple, ovoid, 1-14 cm. long, its divergent branches smooth, spikelet-bearing from near the middle; lemmas awned from about the middle of the back; plant of the Hudson Bay and northern regions........................3. *A. borealis*

1. **A. stolonifera** L. var. **major** (Gaud.) Farw. (*A. alba* of Am. auth., not L.) Redtop

Dry or moist open ground throughout the southern third of the province. Northernmost collection: Grand Rapids, swampy ground (Scoggan, 1948). Earliest collection seen: Brandon, railway clearing (Macoun, 1896). First report: the present publication (but probably the plant listed by Jackson *et al.* [1922] as *A. alba*)

Subarctic circumpolar (including the following and the typical forms): Alaska and central Yukon to James Bay, s. Lab., and Nfld., s. almost throughout the U.S.; s. Greenland; Iceland; Eurasia. Apparently indigenous in various parts of North America, but introduced southward.

1a. **A. stolonifera** var. **compacta** Hartm. (*A. alba* var. *palustris* of Gray's Man., ed. 8)

Attaining a more northern distribution in the province, collected at Churchill by Polunin in 1936 and Gillett in 1948. It is doubtless introduced there, the latter collection bearing the annotation "Occasional in cinders near the mill". First report: the present publication.

Range: see above.

*A. exarata* Trin.: the report of this species from Manitoba by Lowe [1943] is presumably based upon a collection made at Killarney, The specimen has been renamed *A. alba* var. *palustris* by Dore. Jackson *et al.* [1922] include it in their list, under the name *A. asperifolia*.

2. **A. scabra** Willd. Hairgrass. Ticklegrass

Dry or moist sterile soils and rocky clearings throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951). Earliest collection seen: Lake of the Woods, Man., damp ground (Dawson, 1873). First report: Dawson [1875].

Subarctic American: n. Alaska and Great Bear L. to s. Keewatin, s. Lab., and Nfld., s. to Calif., Tex., and Ga.; s. Greenland; e. Asia; closely related to the less northerly *A. hyemalis* (Walt.) BSP., reports of which in Manitoba are referable here. A map of the northern part of the American distribution is given by Raup [1947, pl. XVI].

3. **A. borealis** Hartm.

Known in Manitoba only from the following collections: Churchill (Macoun, 1910); Baralzon Lake, lat. 60° N., dry rocky barrens (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., gravel spit and barren gravel ridge (Baldwin, 1951). First report: Lowe [1943].

(Arctic-)subarctic circumpolar: Seward Pen., Alaska, to Great Bear L., central Keewatin, s. Baffin I., n. Lab., and Nfld., s. to Vancouver I., s. Alta., nw. Sask., n. Man., and the mts. of n. N.E.; southern half of Greenland; n. Eurasia. A map of the American distribution is given by Raup [1930, map 11], on which the above Manitoba stations should be indicated.

*A. perennans* (Walt.) Tuckerm.: the report of this eastern species from Spruce Woods Forest Reserve by Shimek [1927] is probably referable to *A. scabra.*

### 36. Calamovilfa (Gray) Hack.

1. **C. longifolia** (Hook.) Scribn.

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Dropmore, about 100 miles northwest of Brandon, prairie slopes (Scoggan, 1951). Earliest collection seen: Fort Ellice, about 75 miles northwest of Brandon (Macoun, 1872). First report: Burman [1910; as *Ammophila longifolia*].

Temperate American: s. Alta. to s. Ont., s. to Colo., Mo., and Ind.

### 37. Calamagrostis Adans.

(Reed-Bentgrass)

[*See* Stebbins, 1930; North American Flora 17: 501-515. 1937.]

1. Awn bent, longer than the glumes; plants of the Hudson Bay and northern regions.
   2. Panicle open, pyramidal, 4-8 cm. long, purplish, few-flowered, the spreading branches spikelet-bearing toward tip; glumes acuminate, glabrous, mostly 4-6 mm. long; callus-hairs about half as long as lemma; leaf-blades smoothish; low plant (about 15-40 cm. tall)....................................................1. *C. deschampsioides*
   2. Panicle contracted, more or less spike-like, 5-12 cm. long, pinkish or purplish, the short, appressed to erect, crowded branches spikelet-bearing from near base; glumes acute, minutely scabrous, 6-8 mm. long; callus-hairs about one third as long as lemma; leaf-blades scabrous; plant 40-60(-100) cm. tall..................2. *C. purpurascens*

1. Awn straight or bent, not longer than the glumes.

3. Awn bent, protruding sidewise from the glumes, these 4-5 mm. long; panicles contracted; plants of prairie habitats.

4. Callus-hairs about half as long as the lemma; panicles usually pale, 5-10 cm. long; glumes scabrous; leaf-blades mostly less than 2 mm. wide, soon involute; culms 20-40 cm. tall, scabrous below the panicle....................3. *C. montanensis*

4. Callus-hairs about one third as long as lemma; panicles pale or purplish, 7-15 cm. long; glumes glabrous; leaf-blades 2-4 mm. wide, flat, drying involute near tip; culms 60-100 cm. tall, glabrous........................................*C. rubescens*

3. Awn straight or but slightly bent, included.

5. Panicle mostly loose and open, broadly lanceolate to ovoid, 6-30 cm. long, its branches spreading during anthesis, ascending in fruit; callus-hairs equalling or exceeding the lemma, of uniform length except for an outer short ring.

6. Spikelets 2-3·8 mm. long; glumes rounded on the back, weakly keeled, acute or acuminate; lemma 1·7-3 mm. long, its awn inserted near the middle.

7. Panicle loosely flowered; spikelets 2·8-3·8 mm. long; glumes distinctly exceeding the lemma, acute or acuminate......................4. *C. canadensis*

7. Panicle densely flowered; spikelets 2·2-2·8 mm. long; glumes nearly or quite equalled by lemma, obtuse or acutish......4a. *C. canadensis* var. *macouniana*

6. Spikelets 3·8-6 mm. long; glumes narrow, strongly keeled, distinctly acuminate; lemma 3-4·2 mm. long, its awn inserted on the lower third.

8. Spikelets 3·8-4·5 mm. long; glumes often hyaline on tip and margins, short-scabrous on keel, elsewhere minutely scabrous; lemma 3-3·5 mm. long...................................4b. *C. canadensis* var. *robusta*

8. Spikelets 4·5-6 mm. long; glumes usually thick and opaque to tip, scabrous or ciliate on keel, elsewhere pilose-hirtellous; lemma 3·5-4·2 mm. long...................................4c. *C. canadensis* var. *scabra*

5. Panicle narrow and contracted to somewhat open, its rigid branches appressed or ascending even at anthesis; callus-hairs of unequal length, those at the sides of the lemma distinctly longer and tufted.

9. Leaves and top of culm harsh and scabrous; ligules of upper leaves 2·5-8 mm. long (averaging 4), their margins erose or lacerate; callus-hairs mostly shorter than lemma..........................................5. *C. inexpansa*

9. Leaves smooth or sometimes scabrous on tip, margins, and upper surface; culms smooth except just below panicle; ligules of upper leaves 1·5-3·5 mm. long (averaging 2), their margins nearly entire.

10. Spikelets 2-4·8 mm. long; lemma 1·8-3·8 mm. long, its awn straight; palea 1·8-3·8 mm. long; leaves 2-4 mm. broad; culms up to 1 m. high...................................6. *C. neglecta*

10. Spikelets 4·5-5·5 mm. long; lemma 3·8-4 mm. long, its awn curved or weakly bent; palea 2·8-3 mm. long; leaves mostly 2 mm. broad; culms up to 6 dm. high.....................................7. *C. lapponica* var. *nearctica*

### 1. **C. deschampsioides** Trin.

Known in Manitoba only at the following localities: Churchill (Porsild, 1930; Polunin, 1936; Gillett, 1948, saline area occasionally tide-covered; Dore, 1949, moist brackish beach; Brown, 1950, sedge meadow and lichen area on ridge); York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949). First report: Churchill [Ritchie, 1956].

(Arctic-)subarctic circumpolar: n., w., and s. coast of Alaska, coast of nw. Mack., w. coast of Hudson Bay n. to Chesterfield Inlet, e. coast of James Bay, and n. Lab.; similar large gaps (so far as known) in the Eurasian area.

### 2. **C. purpurascens** R. Br.

Known in Manitoba only from the following collection: Nueltin Lake, lat. 59° 43′ N., flank of gravel ridge (Baldwin, 1951). First report: Nueltin Lake [Baldwin, 1953].

Arctic American: n. coasts of Alaska and Mack., Can. Arct. Arch. (n. to lat. 80°), s. to Calif., Nev., Colo., and S.D.; isolated stations on the north shore of L. Superior and in n. and e. Que.; Greenland; ne. Asia. A map of the greater part of the area is given by Raup [1947, pl. XVI], to which should be added the above Manitoba station.

3. **C. montanensis** Scribn.

Dry or moist prairie habitats of southern Manitoba. Northernmost collection: Duck Mountain, prairie opening in mixed woods (Rowe, 1950). Earliest collection seen: Carberry (Jackson, 1921). First report: Lyleton [Lowe, 1943; but "Manitoba" is included in the range given by Hitchcock, N. Am. Fl. 17: 508. 1937].

(Subarctic-)temperate western American: n. Alta. to s. Man., s. Ida., Colo., S.D., and Minn.

*C. rubescens* Buckl. is listed from southern Manitoba by Lowe [1943], but no specimens have been seen. Hitchcock [Manual of the Grasses of the United States, 1st ed., p. 312, 1935] included Manitoba in the range of the species, but dropped it in the 1950 edition, assigning it the range "British Columbia, south to northern Colorado and central California". The species should be excluded from our flora.

4. **C. canadensis** (Michx.) Nutt. Blue-joint

Meadows, shores, thickets, and light woodlands throughout the province except the northeastern barren grounds. Northernmost collection: Churchill, sedge meadow and railway embankment (Gillett, 1948). Earliest collection seen: Brandon, ravine (Macoun, 1896). First report: Burman [1910].

Subarctic American: Alaska, Yukon, and Mack. to s. Keewatin, Que., and Nfld., s. to Calif., N.M., Neb., and Va.

4a. **C. canadensis** var. **macouniana** (Vasey) Stebbins

The following Manitoba specimens have been seen: Souris Plain, Man. (Macoun, 1883); Black River, entering the southeastern side of Lake Winnipeg south of Traverse Bay, damp places (Macoun, 1884); Gladstone, 30 miles northwest of Portage la Prairie (Morgan, 1893); Winnipeg, roadsides and meadows (Burman; undated); Eriksdale, 60 miles north of Portage la Prairie, roadside (Bergsteinson, 1929). First report: Black River and Souris Plain, Man. [Macoun, 1888].

Temperate western American: Sask. to s. Man., s. to Oreg., S.D., and Mo.

Intergrading with the typical form and by Hitchcock [1950] considered scarcely a distinct variety. According to Fassett [1951], var. *macouniana*, var. *typica*, and the following variety, in Wisconsin, take their places in corresponding order on a normal frequency distribution curve obtained by plotting number of individuals against spikelet-length, so that the varieties may perhaps better be considered as merely merging extremes of the main form rather than as distinct entities.

4b. **C. canadensis** var. **robusta** Vasey

The following Manitoba specimens have been seen: Churchill (Macoun, 1910); York Factory, landslide gully, clay soil (Scoggan, 1949); Gillam, about 165 miles south of Churchill, gravel railway embankment (Schofield, 1950); Baralzon Lake, lat. 60° N., dry tundra (Scoggan & Baldwin, 1950); Nejanilini Lake, lat. 59° 22′ N., gravel ridge (Scoggan & Baldwin, 1950); Reindeer Lake, lat. 57° 57′ N., silted shore (Baldwin, 1951). First report: Churchill [Stebbins, Rhodora 32: 43. 1930].

(Arctic-)subarctic American: ne. Alaska and nw. Mack. to n. Man., n. Que., and n. Lab., s. to Calif., N.M., Alta., Que., and N.C. A map of the greater part of the area is given by Raup [1947, pl. XVI].

4c. **C. canadensis** var. **scabra** (Presl) Hitchc. (*C. langsdorfii* of Am. auth., not Trin.)

The following Manitoba specimens have been seen: Nejanilini Lake, lat. 59° 22′ N., gravel ridge (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., barren gravel ridge (Baldwin, 1951). First report: Nejanilini Lake [Scoggan, 1952]. Basis of reports of var. *langsdorfii* (Link) Inman (*C. langsdorfii* Trin.) from the province.

(Arctic-)subarctic circumpolar: n. coast of Alaska and Mack. to s. Baffin I., n. Que., n. Lab., and Nfld., s. to Calif. Colo., the Great Lakes region, and N.E.; Greenland; n. Eurasia.

5. **C. inexpansa** Gray var. **brevior** (Vasey) Stebbins (*C. hyperborea* of Am. auth., in part, not Lange)

Meadows, marshes, clearings, and shores almost throughout the province. Northernmost collection: Churchill (wet tundra, Porsild, 1930; gravel area and edge of pool, Gillett, 1948). Earliest collection seen: Lake Winnipeg (Richardson, specimen undated but presumably collected during the Franklin expeditions of 1819–22; the earliest dated collection seen is that of Macoun in 1883 from "Souris Plain, Man."). First report: the present publication; earlier reports of the main form are referable here, as also the report of "*C. stricta*" by Bell [1881] from York Factory and Hayes River.

(Arctic-)subarctic American: n. Alaska, Mack. R. Delta, and Great Bear L. to central Keewatin, n. Lab., and Nfld., s. to Calif., N.M., Neb., Ind., and N.E.; in general more northerly than the larger-flowered main form.

6. **C. neglecta** (Ehrh.) Gaertn., Mey. & Scherb.

Meadows, marshes, and shores almost throughout the province. Northernmost collection: Churchill (several collections, the first by Polunin in 1936). Earliest collection seen: York Factory (McTavish, 1854); but Macoun [1888] cites a collection by Douglas in 1827 from Red River. First report: York Factory and Red River; "Abundant in wet prairie throughout Manitoba..." [Macoun, 1888; as *Deyeuxia neglecta*].

Arctic circumpolar: n. coast of Alaska and N.W.T., Devon I., central Baffin I., n. Lab., and Nfld., s. to Calif., Colo., Wisc., and Me.; southern half of Greenland; Iceland; Spitsbergen; Eurasia. A map of the northern part of the American area is given by Raup [1947, pl. XVI].

7. **C. lapponica** (Wahl.) Hartm. var. **nearctica** Porsild

Known in Manitoba only from the following collections: Nueltin Lake, lat. 59° 48′ N., gravel ridge and barren island (Baldwin, 1951); Reindeer Lake, lat. 57° 54′ N., dry sandy trail through jack-pine woods (Baldwin, 1951). First report: Nueltin and Reindeer lakes [Baldwin, 1953].

(Arctic-)subarctic American: interior Alaska, n. Mack., and n. Keewatin to s. Baffin I. and n. Lab., s. to s. Alta., s. Sask., n. Man., central Que., and central Lab.; w. Greenland; e. Asia (?); with the main form, arctic circumpolar.

*C. confinis* (Willd.) Nutt.: this species is included by Hitchcock [1950; under *Arundo confinis*] in his list of "Unidentified Names". The report of this plant from Churchill by Gröntved [1936] is undoubtedly referable to either *C. inexpansa* var. *brevior* or *C. neglecta.*

### 38. ARCTAGROSTIS Griseb.

1. **A. latifolia** (R. Br.) Griseb.

Known in Manitoba only from Churchill, the earliest collection seen being one by Macoun in 1910. First report: Churchill [Størmer, 1933]; but listed by Rae [1850] from "between Churchill and Repulse Bay".

Arctic circumpolar: n. coast of Alaska, Yukon, and N.W.T., Can. Arct. Arch. (to northernmost Ellesmereland), to n. Que., s. to s. Yukon and n. Man.; Greenland; n. Eurasia. A map of the distribution is given by Porsild [Canadian Geographical Journal, March 1951 (fig. 2), p. 24]. *A. poaeoides* Nash, accredited to Manitoba in the range given by Rydberg [1932], is undoubtedly referable to *A. latifolia.*

### 39. BECKMANNIA Host

1. **B. syzigachne** (Steud.) Fern. (*B. erucaeformis* of Am. auth., not Host) Slough-Grass

Marshes, shallow water, and shores almost throughout the province. Northernmost collection: Churchill (several collections, the earliest seen being that of Porsild in 1930). Earliest collection seen: Fort Garry (Macoun, 1872); but Macoun [1888] reports an 1826 collection by Douglas from Red River. First report: Churchill River [Bell, 1880].

Subarctic American: central Alaska and Mack. R. Delta to n. Man. and Que., s. to Calif., N.M., Kans., and Pa.

### 40. BOUTELOUA Lag.

(Grama-Grass)

1. Spikes 1-6, 2-5 cm. long; spikelets 5-6 mm. long, 35-80 in a dense comb-like group on the outer side of the curved rachis. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *B. gracilis*
1. Spikes many, 0·8-2 cm. long, spreading or reflexed, each with 5-8 spikelets, these 7-10 mm. long. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *B. curtipendula*

1. **B. gracilis** (HBK.) Lag. (*B. oligostachya* (Nutt.) Torr.)

Dry prairie, slopes, and sandhills of southern Manitoba. Northernmost collection: Bield, south of Duck Mountain, isolated prairie hills (Scoggan, 1951). Earliest collection seen: Winnipeg, dry prairie (Macoun, 1872). First report: Turtle Mountain [Dawson, 1875].

Temperate western American: B.C. to Man. and Wisc., s. to Tex., Mo., and n. Ill.; Mexico.

*B. hirsuta* Lag. is reported from sandy prairie at Carberry by Shimek [1927], together with *B. gracilis* and *B. curtipendula*. No Manitoba specimens have been seen, however, and the species must be excluded from our flora at present, although it occurs in neighbouring North Dakota.

2. **B. curtipendula** (Michx.) Torr. (*B. racemosa* Lag.)

Dry prairie, slopes, and sandhills of southern Manitoba. Northernmost collection: Stony Mountain (several collections, the first by Burman in 1898). Earliest collection seen: near Winnipeg, gravel bank (Fletcher, 1882). First report: Fort Garry [Macoun, 1888].

Temperate American: Mont. to s. Man., s. Ont., and Conn., s. to Calif., Tex., Ala., and Ga.

### 41. SCHEDONNARDUS Steud.

1. **S. paniculatus** (Nutt.) Trel.

Specimens have been seen from only the following localities: Medora, about 55 miles southwest of Brandon, alkaline prairie (Scoggan, 1951); Melita, about 60 miles southwest of Brandon, alkaline soil of abandoned Souris River channel (Scoggan, 1953). First report: Turtle Mountain [Macoun, 1888; as *S. texanus*].

Temperate western American: Alta. to s. Man., s. to Ariz. and La.; S. Am.

### 42. SPARTINA Schreb.

(Cord-Grass)

1. Spikes 4-8, 2-4 cm. long; spikelets 6-8 mm. long; glumes acute, awnless; leaves mostly less than 5 mm. wide; culms slender, rarely more than 1 m. tall . . . . . . . . . 1. *S. gracilis*
1. Spikes 5-30, mostly 4-8 cm. long; spikelets 12-15 mm. long; upper glume tapering into an awn 3-7 mm. long; leaves 4-15 mm. wide; culms stout, up to 2 m. tall . . 2. *S. pectinata*

1. **S. gracilis** Trin.

Meadows, marshes, and prairie (particularly in alkaline areas) in the southern third of the province. Northernmost collection seen: Dawson Bay, Lake Winnipegosis, salt marsh at mouth of Red Deer River (Scoggan, 1948); map 25 of Raup [1930], however, shows a more northern station in the vicinity of Norway House. Earliest collection seen: Brandon, damp prairie (Macoun, 1896). First report: Burman [1910]; although Macoun [1888] notes the species as "Very abundant in salt marshes throughout the whole prairie region".

(Subarctic-)temperate western American: B.C., n. Alta., s. Sask., and central Man., s. to Calif., N.M., and Kans.

2. **S. pectinata** Link (*S. michauxiana* Hitchc.)

Wet prairie, swamps, and shores of southern Manitoba. Northernmost collection: Oak Point, about 60 miles northwest of Winnipeg, wet ground (Scoggan, 1951). Earliest collection seen: Portage la Prairie, prairies and open plains (Macoun, 1872). First report: Jackson *et al.* [1922]; earlier reports of *S. cynosuroides*, a more southerly species, are referable here, as, for instance, the report by Macoun [1888] of an 1826 collection by Douglas from Red River.

(Subarctic-)temperate American: Great Slave L. to s. Sask., the Great Lakes region, e. Que., and Nfld., s. to Oreg., Tex., and N.C.

### 43. BUCHLOË Engelm.

1. **B. dactyloides** (Nutt.) Engelm. Buffalo-Grass

The following is the only Manitoba collection seen: Coulter, about 70 miles southwest of Brandon, alkaline flats of Souris River channel (Scoggan, 1953). First report: apart from the foregoing citation, the only other indication of the occurrence of the species in Manitoba appears to be the inclusion of the province in the range given by Fernald [1950]; no Manitoba specimens are present in the Gray Herbarium of Harvard University.

Temperate western American: Alta. to s. Man., s. to Ariz. and La.; Mexico.

### ***Munroa*** Torr.

*M. squarrosa* (Nutt.) Torr.: Manitoba is included in the range given by Fernald [1950] for this species, but there are no supporting specimens in the Gray Herbarium. It is probable that this citation is based upon a collection by Macoun of the species from Red Deer River, Alberta (not the Red Deer River of central Manitoba), in 1879. This specimen, in the National Herbarium of Canada, has the added annotation "N.W.T." crossed out and replaced by "Alta.", and is cited by Macoun [1888] as "On alluvium in the valley of Red Deer River, five miles east of the Hand Hills, Alberta, 1879". According to Tisdale and Budd [Canadian Field-Naturalist 62: 174. 1948], there is no record of this grass for Manitoba.

### 44. HIEROCHLOË R. Br.

(Holy Grass)

1. Panicle contracted, 2-5 cm. long; staminate lemmas awned below the tip, the awn of the second lemma 5-8 mm. long, bent, twisted below, that of the first a little shorter, straight; spikelets 7-8 mm. long, olive-green; upper leaf-sheaths inflated, their blades very small; culms 1-4 dm. high; plant of the Hudson Bay region .................... 1. *H. alpina*

1. Panicle open, pyramidal, 3-14 cm. long; lemmas awnless; spikelets 4-8 mm. long, brownish, bronze, or purple; stem-leaves 2 or 3, short; culms 3-6(-9) dm. high ....... 2. *H. odorata*

1. **H. alpina** (Sw.) R. & S.

The following are the only Manitoba specimens seen: "Northern Manitoba" (Marsh, 1936); Baralzon Lake, lat. 60° N., dry rocky barrens (Scoggan & Baldwin, 1950). A Churchill station is also noted by Raup [1947, pl. XVII] on a map showing the greater part of the American distribution. First report: Churchill [Jackson *et al.*, 1922; as *Savastana alpina*]; but recorded by Rae [1850] from "Between Churchill and Repulse Bay".

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to about lat. 80° N.), n. Lab., and Nfld., s. to n. B.C., n. Man., and e. Que.; circumgreenlandic; Spitsbergen; n. Eurasia.

2. **H. odorata** (L.) Beauv. (*H. borealis* R. & S.) Sweet Grass

Meadows, prairie, and shores almost throughout the province. Northernmost collection: Churchill (several collections, the first by Porsild in 1930). Earliest collection seen: York Factory (McTavish, 1856). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Arctic circumpolar: n. Alaska, n. Yukon, Victoria I., and Great Bear L. to n. Sask., n. Que., n. Lab., and Nfld., s. to Ariz., N.M., S.D., Pa., and n. N.J.; Iceland; n. Eurasia.

### 45. PHALARIS L.

### (Canary-Grass)

1. Inflorescence a single ovate spike-like panicle 1·5-4 cm. long; spikelets broadly obovate, 5-6 mm. long; glumes broad, 7-8 mm. long, whitish, with green veins, the keel broadly winged above; annual plant 3-8 dm. high ........................ 1. *P. canariensis*
1. Inflorescence 5-20(-30) cm. long, with many dense club-shaped branches, these spreading in anthesis, appressed in fruit; spikelets lanceolate, 4-6 mm. long; glumes about 5 mm. long, narrow, narrowly winged above; perennial plant of moist places, 6-20 dm. high.. ........................................................ 2. *P. arundinacea*

1. P. CANARIENSIS L. Canary-Grass

"An annual weed occasionally appearing in gardens and waste land." [Lowe, 1943]. The following specimens have been seen: Winnipeg, "yard" (Burman, 1900); Carman, about 50 miles southwest of Winnipeg (1931; name of collector not stated); Morden, about 65 miles southwest of Winnipeg (Helgason, 1945); Strathclair, 40 miles northwest of Brandon (specimen undated; name of collector not given). First report: Jackson *et al.* [1922].

European: widely distributed in waste places throughout much of North America.

2. **P. arundinacea** L. Reed-Canary-Grass

Meadows, marshes, and shores throughout the southern half of the province. Northernmost collection: Bear Lake, north of Oxford Lake (Moore, 1953). Earliest collection seen: Lake Winnipeg (Richardson; specimen undated, but presumably collected during Franklin's expeditions of 1819-22) (the earliest dated specimen seen is one from "Souris Plain, Man.", collected by Macoun in 1883). First report: Red River, open prairie [Dawson, 1875].

Subarctic circumpolar: central Alaska to central Man., e. Que., and Nfld., s. to Calif., Okla., and N.C.; Eurasia.

Forma *variegata* (Parnell) Druce, with white-striped leaves, has been found at Lac du Bonnet, Morden, Napinka, and Brokenhead.

## 46. Leersia Sw.

1. **L. oryzoides** (L.) Sw. Rice-Cutgrass

Known in Manitoba from the following localities: Aweme, about 20 miles southeast of Brandon (Criddle, 1911); Sturgeon Creek, near Winnipeg (Jackson, 1921); Winnipeg, wet mud by creek (Dore, 1950); Elie, about 25 miles west of Winnipeg, along LaSalle River (Dore, 1950); Westbourne, about 15 miles northwest of Portage la Prairie, wet muddy shore of Whitemud River (Dore, 1950). First report: Sturgeon Creek [Jackson *et al.*, 1922; as *Homalocenchrus oryzoides*].

Temperate ?circumpolar: B.C. to Que., s. to Calif., Tex., and Fla.; Europe.

## 47. Zizania L.

(Wild Rice)

1. **Z. aquatica** L. var. **interior** Fassett

Quiet waters and shores of southern Manitoba. Northernmost collection seen: Jessica Lake, Whiteshell Forest Reserve (Hinks 1939); but Hallowell [Rhodora 37: 302-304. 1935] reports it as far north as lat. 52° 35′ on the east side of Lake Winnipeg north of Berens River. Earliest collection seen: Roseau River, south of Winnipeg (Dawson, 1873). First report: Brokenhead River, two miles east of Beausejour [with photograph, in article "Wild Rice" by Edward Taube, Scientific Monthly 73: 369-375. Dec. 1951, to which the reader is referred for an interesting account of the harvesting and use of this plant by the North American Indian tribes]; earlier reports of the main form are referable here.

Temperate American: isolated in Ida.; s. Man. to Mich., s. to S.D. and Ind.; further east and south, the main form and two varieties.

## 48. Sorghastrum Nash

1. **S. nutans** (L.) Nash Indian Grass

The following Manitoba specimens have been seen: Woodroyd, about 15 miles northwest of Winnipeg (Watts, 1894); Souris, 20 miles southwest of Brandon, open prairie (Macoun, 1896); Morris (Macoun, 1896); Westbourne, 15 miles northwest of Portage la Prairie, sandy soil (Peturson & Johnson, 1934); Arnaud, about 40 miles south of Winnipeg, open meadow (Campbell, 1939); Woodlands, about 15 miles northwest of Winnipeg (Simpson, 1944); Dominion City, about 45 miles south of Winnipeg, prairie patch along road (Dore, 1948); Brandon, dry prairie (Stevenson, 1949); Brokenhead, about 30 miles northeast of Winnipeg, sandy open jack-pine woods (Scoggan & Mosquin, 1953). The species is also reported from High Bluff near Portage la Prairie [Macoun, 1888]; Macgregor, fertile prairie [Shimek, 1927]; and Beaver, near Portage la Prairie [Jackson *et al.*, 1922]. First report: High Bluff [Macoun, 1888; as *Chrysopogon nutans*].

Temperate American: Wyo. to s. Man. and s. Que., s. to Ariz., Tex., and Fla.

## 49. ANDROPOGON L.

(Beardgrass)

1. Raceme single at the tip of each peduncle; pedicels and joints of rachis upwardly enlarged; awns 6-8 mm. long....................................1. *A. scoparius*
1. Racemes in digitate clusters of 2 or more at the tip of each peduncle; pedicels and joints of rachis not upwardly enlarged.
   2. Awn of fertile spikelet 8-15 mm. long, twisted below; rhizome short; plant scarcely glaucous....................................2. *A. gerardi*
   2. Awn of fertile spikelet wanting or up to 6 mm. long, straight; rhizome elongate; plant glaucous....................................3. *A. hallii*

1. **A. scoparius** Michx. (*Schizachyrium scoparium* Nash) Wiregrass

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Dropmore, about 100 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Ellice, about 75 miles northwest of Brandon, dry sandy soil (Macoun, 1872). First report: Souris River, dry bank [Dawson, 1875]. Some of the Manitoba material appears referable to var. *septentrionalis* Fern. & Grisc., and possibly also var. *frequens* Hubbard.

Temperate American: Alta. to Que. and n. N.E., s. to Ariz., Tex., and Fla.

2. **A. gerardi** Vitman (*A. provincialis* Lam., not Retz.; *A. furcatus* Muhl.)

Dry or moist prairie, slopes, and sandhills in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest shore of Lake Winnipeg, calcareous slope and swampy ground (Scoggan, 1948). Earliest collection seen: Red River (Douglas, 1826). First report: Turtle Mountain, open prairie [Dawson, 1875].

Temperate American: Sask. to s. Que., s. to Ariz., Tex., and Fla.

3. **A. hallii** Hack.

Dry prairie and sandhills of southwestern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sand dunes (Dore, 1951). Earliest collection seen: Aweme, about 15 miles southeast of Brandon, sandhills (Fletcher, 1905). First report: the present publication.

Temperate western American: Mont. to sw. Man., s. to Ariz., Tex., and Ia.

## 50. SETARIA Beauv.

(Bristly Foxtail)

1. Bristles below each spikelet 5 or more, upwardly barbed, yellowish to orange; fertile lemma strongly cross-wrinkled; margins of leaf-sheaths not ciliate.........1. *S. glauca*
1. Bristles 1-3, greenish, straw-yellow, or purple; fertile lemma not cross-wrinkled; margins of leaf-sheaths ciliate.
   2. Bristles downwardly barbed; panicle often interrupted, narrow, 5-12 mm. thick...........................................2. *S. verticillata*

2. Bristles upwardly barbed; panicle dense, sometimes interrupted at base.
   3. Spikelets 1·8-2·5 mm. long, falling with the grain; panicle up to 2·3 cm. thick; leaves up to 15 mm. wide. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .3. *S. viridis*
   3. Spikelets 2-3 mm. long, the grain dropping free from the glumes; panicle up to 3·5 cm. thick; leaves up to 3 cm. broad. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4. *S. italica*

1. S. GLAUCA (L.) Beauv. (*S. lutescens* (Wieg.) Hubb.) Foxtail

Only one Manitoba specimen has been seen: Morden, about 60 miles southwest of Winnipeg (Marshall, 1941), although Lowe [1943], in the first report for the province, notes it as of frequent occurrence on cultivated land.

Eurasian: widely naturalized in North America.

2. S. VERTICILLATA (L.) Beauv.

Known in Manitoba only from Brandon, where it was collected by Stevenson in 1949 and 1950 around buildings and in cultivated fields, spreading from the forage area of the Dominion Experimental Farm where the original cultivation was made. First report: the present publication.

Eurasian: naturalized in various parts of the United States and adjacent Canada.

3. S. VIRIDIS (L.) Beauv. Green-Foxtail. Bottle-Grass

Sandy prairie, sandhills, clearings, and waste places throughout southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy prairie (Scoggan, 1951). Earliest collection seen: Brandon, railroad clearing (Macoun, 1896). First report: Emerson [Macoun, 1888]. Some of the Manitoba material may be referable to var. *weinmannii* (R. & S.) Brand, smaller in most measurements than the main form.

Eurasian: widely naturalized in the United States and adjacent Canada.

4. S. ITALICA (L.) Beauv. German or Hungarian Millet

Known in Manitoba from Morden (cultivated field, Macoun, 1896) and the vicinity of Winnipeg (Higham, 1940). First report: the present publication.

Eurasian: widely naturalized in the United States and adjacent parts of Canada.

### 51. DIGITARIA Heist.

1. D. ISCHAEMUM (Schreb.) Muhl. Small Crab-Grass

Known in Manitoba only from Winnipeg, where it was collected in 1936 on a lawn by J. Walker (specimen determined by W. G. Dore). First report: the present publication.

Eurasian: widely naturalized in the United States and adjacent Canada.

## 52. ECHINOCHLOA Beauv.

(Barnyard-Grass)

1. Tip of coriaceous and lustrous fertile lemma withered and dull, appendage-like, marked off by a ring of microscopic bristles; bristles of spikelet slender, mostly not pustular-based.......................................................1. *E. crusgalli*
1. Tip of coriaceous lemma firm, merging gradually with the lustrous body and without a transitional ring of minute bristles.
   2. Panicle green or purple-tinged; bristles of spikelet mostly slender and without pustular bases....................................2. *E. pungens* var. *wiegandii*
   2. Panicle commonly deep violet-purple; second glume and sterile lemma with coarse, pustular-based, divergent hairs on ribs and margins..2a. *E. pungens* var. *microstachya*

1. E. CRUSGALLI (L.) Beauv.

Clearings and waste places of southern Manitoba. Northernmost collection: Dropmore, about 100 miles northwest of Brandon, sandy roadside (Scoggan, 1951). Earliest collection seen: Brandon (Weinstock, 1923). First report: Burman [1910; as *Panicum Crus-galli*].

Eurasian: widely naturalized in North America.

2. **E. pungens** (Poir.) Rydb. var. **wiegandii** Fassett

Clearings and waste places of southern Manitoba. Northernmost collection: Dauphin, north of Riding Mountain, dry roadside (Scoggan, 1951). Earliest collection seen: Brandon, boggy ground (Macoun, 1896; determined by W. G. Dore). First report: the present publication.

Temperate American: Wash. to s. Man. and Wisc., s. to Calif., Tex., Kans., and Ill.; N.E.

2a. **E. pungens** var. **microstachya** (Wieg.) Fern. & Grisc.

Known in Manitoba only from Haywood, about 45 miles southwest of Winnipeg, where it was collected in moist sand of a roadside ditch by Dore in 1950, with the foregoing variety. First report: the present publication.

Temperate American: Wyo. to s. Man. and sw. Que., s. to n. Mex., Tex., Mich., and Pa.

*E. frumentacea* (Roxb.) Link was collected at Brokenhead, about 30 miles northeast of Winnipeg, by T. Mosquin in 1952, but is scarcely naturalized as a firm constituent of our flora.

## 53. PANICUM L.

(Panic-Grass)

1. Plants annual, with soft bases, or, if perennial, with hard, closely scaly rhizomes; basal leaves not forming prostrate winter-rosettes; spikelets glabrous.
   2. Plants annual, with a tuft of roots at base.
      3. Spikelets 2-4 mm. long, lance-ovoid; panicle erect, large and diffuse, up to two-thirds the height of the plant, often purple, with ascending to divergent capillary branches, brittle and becoming a "tumbleweed".
         4. Spikelets 2-3 mm. long, short-acuminate, mostly on long pedicels; panicle one-third to half the height of the plant, the lower branches included in the uppermost leaf-sheath until maturity...................................1. *P. capillare*

4. Spikelets 2·5-4 mm. long, long-acuminate, mostly subsessile or on pedicels shorter than to scarcely exceeding their length; panicle up to two-thirds the height of the plant, commonly exserted................1a. *P. capillare* var. *occidentale*

3. Spikelets 4·5-5·5 mm. long, ovoid, acuminate, turgid; panicle rather dense, arching in maturity, its numerous, very scabrous branches ascending......2. *P. miliaceum*

2. Plant perennial, with hard, closely scaly, creeping rhizomes; panicles long-exserted, with ascending to strongly appressed, slightly scabrous branches; spikelets 2·8-6 mm. long, ovoid, acuminate, strongly nerved; leaves firm, scabrous on the margins, taper-pointed..................................................3. *P. virgatum*

1. Plants perennial, without elongate rhizomes, in the autumn frequently developing a rosette of broader leaves that live over winter; spikelets glabrous or pubescent.

5. Spikelets very small, 1-1·5 mm. long, numerous and long-pedicelled, pilose; panicles pyramidal to broad-ovoid, 3-12 cm. long, with flexuous, freely forking, often somewhat entangled branches, these finally spreading or the lower ones drooping; leaf-blades and sheaths long-pilose..........................4. *P. lanuginosum* var. *implicatum*

5 Spikelets 2 mm. or more long.

6. Spikelets 3-4 mm. long, long-villous with soft hairs, these up to the diameter of the spikelet in length; panicle 5-15 cm. long, with few, remotely flowered, ascending to erect branches; leaf-sheaths (and blades, at least beneath) papillose-hispid........ ........................................................5. *P. leibergii*

6. Spikelets glabrous to pilose, but not long-villous.

7. Spikelets of the autumnal plant borne (often hidden) in the lower sheaths of the tufted culms (No. 9 may be sought here); distinct winter-rosettes absent.

8. Spikelets acutely beaked, 3-4·5 mm. long, distinctly exceeding the fruit, glabrous or sparsely pilose; vernal panicles 3-10 cm. long, with few, strongly ascending, branches.

9. Leaf-sheaths copiously pilose.......................6. *P. depauperatum*

9. Leaf-sheaths glabrous or only sparsely pilose......................... ................................6a. *P. depauperatum* var. *psilophyllum*

8. Spikelets rounded or subacute at tip, beakless, scarcely exceeding the fruit, pilose.

10. Leaf-sheaths copiously pilose; panicle-branches erect or slightly ascending; spikelets 2·7-3·6 mm. long; grain rounded-ellipsoid, 1·6-2 mm. wide...... ..................................................7. *P. perlongum*

10. Leaf-sheaths nearly or quite glabrous; panicle-branches spreading-ascending; spikelets 2-2·7 mm. long; grain narrowly ellipsoid, 1-1·3 mm. wide....... .....................................8. *P. linearifolium* var. *werneri*

7. Spikelets not borne in the lower sheaths.

11. Spikelets small, up to 2 mm. long; characters otherwise as in No. 4.......... ....................................4a. *P. lanuginosum* var. *septentrionale*

11. Spikelets 2·6-4 mm. long.

12. Spikelets 2·6–3·2 mm. long, pilose; autummal culms branching from the base, forming bushy tufts with rigid, erect leaf-blades, these often hiding the panicles....................................................... ...............................................9. *P. wilcoxianum*

12. Spikelets 3·2-4 mm. long, glabrous or minutely pubescent to sparsely hirsute.

13. Spikelets 3·2-3·6 mm. long, glabrous or sparsely hirsute; panicle 4-12 cm. long, one-half to about as broad as long; leaf-blades ascending or spreading, the larger 0·6-1·5 cm. wide, glabrous or finely pubescent beneath....................10. *P. oligosanthes* var. *scribnerianum*.

13. Spikelets 3·7-4 mm. long, glabrous or minutely pubescent; panicle 3-15 cm. long, narrow, with few, stiff, erect or strongly ascending branches; leaf-blades erect, 0·5-2·2 cm. broad, glabrous........... ........................................11. *P. xanthophysum*

1. **P. capillare** L. Old-witch Grass

Sandy prairie, gardens, and waste places of southern Manitoba. Northernmost collection: Stony Mountain, about 10 miles north of Winnipeg (Groh, 1922). Earliest collection seen: Killarney, about 45 miles south of Brandon (Macoun, 1896). First report: Macoun [1888]; but the Washow Bay specimen cited was later referred to the following variety by Hitchcock [1950].

Temperate American: Mont. to s. Man. and sw. Que., s. to Tex. and Fla.

1a. **P. capillare** var. **occidentale** Rydb. (*P. barbipulvinatum* Nash)

Specimens have been seen from the following localities: Washow Bay, Lake Winnipeg (Macoun, 1884); Winnipeg, (Malte 1917); Caddy Lake, east of Winnipeg near the Ontario boundary (Simpson, 1949). First report: Jackson *et al.* [1922].

Temperate American: B.C. to Que. and P.E.I., s. to Calif., Tex., Mo., and N.J.

2. P. MILIACEUM L. Millet

Known in Manitoba from the following localities: Pierson, west of Turtle Mountain (Dudley, 1939); St. Vital, near Winnipeg (Higham, 1940); Giroux, southeast of Winnipeg (Lowe, 1941); Stonewall, north of Winnipeg (Denike, 1942); St. Norbert, near Winnipeg (Dore and Johnson, 1948); Domain, south of Winnipeg (Dore, 1948). First report: Stonewall [Groh & Frankton, 1949].

Eurasian: widely introduced and escaped from cultivation throughout the United States and adjacent Canada.

3. **P. virgatum** L. Switchgrass

Dry or moist prairie and clearings of southern Manitoba. Northernmost collection seen: St. Laurent, about 50 miles northwest of Winnipeg, grassy prairie (Scoggan, 1951); but Macoun [1888] reports the species from as far north as Red Deer River, north of Porcupine Mountain. Earliest collection seen: Red River (Douglas, 1826). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Temperate American: Sask. to sw. Que., s. to Ariz. and Fla.; Mex. and Central America.

4. **P. lanuginosum** Ell. var. **implicatum** (Scribn.) Fern

Specimens have been seen from the following localities: Winnipeg (Burman, 1901); Victoria Beach, dry pine woods (Denike, 1942; Breitung, 1949); Lac du Bonnet, about 50 miles northeast of Winnipeg, dry sandy pine woods (Breitung, 1949); Sandilands Forest Reserve, dry pine woods (Breitung, 1949); Deerhorn, about 70 miles northwest of Winnipeg, clearing (Scoggan, 1951); Whiteshell Forest Reserve, granite outcrops (Scoggan, 1951). First report: the present publication.

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Mo. and s. N.Y.

4a. **P. lanuginosum** var. **septentrionale** Fern.

The following specimens have been seen: "Lake Winipeg Valley" (Bourgeau, 1857); Brokenhead, about 30 miles northeast of Winnipeg (A. & D. Löve, 1952). First report: Lake Winnipeg Valley [Fernald, Rhodora 23: 228. 1921; as *P. lindheimeri* var. *septentrionale*].

Temperate eastern American: se. Man. to N.B. and N.S., s. to Kans. and Va.

5. **P. leibergii** (Vasey) Scribn.

Dry prairie and clearings of southern Manitoba. Northernmost collection: Sasaginnigak Lake, near the Ontario boundary about 110 miles northeast of Winnipeg, dry rocks (Breitung, 1949). Earliest collection seen: Deloraine, 50 miles southwest of Brandon (Fletcher, 1896). First report: Lowe [1943].

Temperate American: Sask. to N.Y., s. to Kans. and Pa.

6. **P. depauperatum** Muhl.

Specimens have been seen from the following localities: Lac du Bonnet, dry sandy pine woods (Breitung, 1949); Victoria Beach, sandy pine woods (Breitung, 1949); Whiteshell Forest Reserve, gravel bank and rock crevices (Dore, 1950). First report: Poplar Point, 35 miles southeast of Brandon (Campbell collection cited in undated supplement to the 1943 checklist of Lowe).

Temperate eastern American: se. Man. to s. Que., s. to e. Tex. and S.C.

6a. **P. depauperatum** var. **psilophyllum** Fern.

The following specimens have been seen: Victoria Beach (woods Denike, 1942; sandy roadside, Groh, 1945); Whitemouth, about 50 miles east of Winnipeg, dry sandy jack-pine woods (Scoggan, 1951). First report: the present publication.

Temperate eastern American: se. Man. to Que., s. to Tenn. and N.C.

7. **P. perlongum** Nash

The following specimens have been seen: "Lake Winipeg Valley" (Bourgeau, 1857; specimen in Gray Herbarium determined by Hitchcock and Chase); Sidney, 40 miles east of Brandon, aspen-oak woodland on sand dunes (Boivin & Breitung, 1949); Sandilands Forest Reserve, sandy pine woods (Breitung, 1949); Whiteshell Forest Reserve, granite outcrop (Scoggan, 1951). First report: Jackson *et al.* [1922].

Temperate eastern American: s. Man. to Mich., s. to e. Tex. and Ind.

8. **P. linearifolium** Scribn. var. **werneri** (Scribn.) Fern.

The following Manitoba specimens have been seen: Lac du Bonnet, about 50 miles northeast of Winnipeg, Precambrian outcrops (Breitung, 1949); Whiteshell Forest Reserve, granite outcrops (Scoggan, 1951). First report: the present publication.

Temperate eastern American: se. Man. to s. Que., s. to e. Tex., Ky., and Va.

9. **P. wilcoxianum** Vasey

Dry prairie, sandhills, and sandy clearings of southwestern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy prairie (Scoggan, 1953). Earliest collection seen: Sewell (now Camp Hughes), near Brandon (Macoun, 1896). First report: Lowe [1943].

Temperate (interior) American: s. Man. to Wisc., s. to Colo., Kans., and Ind.

10. **P. oligosanthes** Schultes var. **scribnerianum** (Nash) Fernald (*P. scribnerianum* Nash)

Specimens have been seen from the following localities: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873); Whiteshell Forest Reserve, dry sandy clearing (Scoggan, 1951). Also reported from sandy prairie and sand dunes at Carberry [Shimek, 1927]; dry prairie of Spruce Woods Forest Reserve [Bird, 1927]; and Aweme [Lowe, 1943]. First report: Red River Valley [Jackson *et al.*, 1922]; but presumably based upon the report by Macoun [1888] of *P. pauciflorum* Ell. from Emerson and Red River, this synonymous with the main form, not the variety.

Temperate American: B.C. to Me., s. to Ariz., Mo., and Va.

11. **P. xanthophysum** Gray

Sandy or rocky open soil or jack-pine woods of southeastern Manitoba. Northernmost collection seen: Victoria Beach, sandy pine woods (Lowe, 1939; Groh, 1945; Breitung, 1949). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857; specimen in Gray Herbarium determined by Hitchcock and Chase). First report: St. Vital and Fort Ellice [Jackson *et al.*, 1922].

Temperate American: Sask. to s. Que., s. to Minn. and Pa.

## 18. CYPERACEAE

### (Sedge Family)

1. Flowers all perfect, in uniform spikelets; achenes bare.
   2. Scales of the spikelet strictly 2-ranked, folded lengthwise and keeled; spikelets few-many-flowered, in clusters disposed in a simple or compound terminal umbel; perianth-bristles absent; culms triangular.........1. *Cyperus*
   2. Scales of spikelet usually several-ranked, spirally arranged; perianth-bristles mostly present, adherent to base of achene; culms mostly round, sometimes triangular.
      3. Base of style persistent as a tubercle at summit of achene.
         4. Culms leafless, the basal coloured sheaths usually bladeless; spikelet solitary and terminal.........2. *Eleocharis*
         4. Culms capillary, leafy, 3-angled; spikelets 1-10 in each of 2 clusters, one terminal, the other axillary.........3. *Rhynchospora*

3. Base of style not persistent as a tubercle.
 5. Perianth-bristles 1-8 or sometimes wanting, mostly not much longer than the achene........................................................4. *Scirpus*
 5. Perianth-bristles very numerous, elongate and silky.............5. *Eriophorum*

1. Flowers unisexual, the staminate and pistillate in the same or in different spikes; achene inclosed in a sac or spathe; culm sharply or obtusely 3-angled.
 6. Achenes surrounded by a spathe open on one side above the middle; head of spikes 1-4 cm. long, the crowded appressed spikes 3-8 mm. long, the terminal one staminate, the others staminate at apex or pistillate; scales chestnut-coloured, white-margined; leaves firm, involute-filiform, in crowded, brown-based tufts; plant of the Hudson Bay region........................................................6. *Kobresia*
 6. Achene inclosed in a sac (perigynium), this sometimes inflated.............7. *Carex*

## 1. Cyperus L.

### (Galingale)

1. Tips of scales slender and recurved; spikelets greenish, finally pale brown, 2-9 mm. long, in dense, subcylindric to subglobose spikes; soft-based annual of wet sandy soil........................................................................1. *C. inflexus*

1. Tips of scales not strongly recurved; plants perennial.
 2. Base of stem bearing long filiform stolons terminated by hard tubers; spikelets yellowish to golden-brown, densely flowered, 5-15 mm. long, mostly 4-ranked along the wing-angled rachis; scales 2·3-3 mm. long; plant of damp sandy soil.........*C. esculentus*
 2. Base of stem hard and corm-like or with corm-like branches.
  3. Spikelets yellowish to golden, densely flowered, 5-18 mm. long; scales 3-4·5 mm. long, with green midrib and thin golden margins; achenes linear, acute; plant of damp meadows and shores..........................................2. *C. strigosus*
  3. Spikelets greenish-brown, rather loosely flowered; achenes ellipsoid; plants of dry sandy soil.
   4. Scales ovate, acuminate, 3·5-4·5 mm. long; achenes light-brown, 2·5-3·5 mm. long; involucral-leaves scabrous-margined; culms sharply angled, scabrous..........................................................3. *C. schweinitzii*
   4. Scales roundish, abruptly short-tipped, 2-2·8 mm. long; achenes dark brown, 1-1·5 mm. long; involucral-leaves smooth; culms obtusely angled, smooth..........................................................4. *C. houghtonii*

1. **C. inflexus** Muhl. (C. *aristatus* of auth., not Rottb.)

Hooker [1839] cites this species from Lake Winnipeg, based upon a collection by Richardson, presumably during the Franklin expeditions of 1819-22. The specimen has not been seen, but is accepted by Horvat [The Catholic University of America, Biological Series No. 33, 1941], upon whose authority the species is included as a constituent of our flora. Fernald [1950] includes southern Manitoba in his range for the plant. First report: Lake Winnipeg [Hooker, 1839].

Temperate American: s. B.C. to sw. Que., s. throughout the U.S. to Mex. and S. Am.

*C. esculentus* L. is accredited to southern Manitoba in the range assigned to the species by Fernald [1950]. No specimens have been seen, however, and it must be excluded from our flora for the present.

2. **C. strigosus** L.

Two specimens have been seen, the first within the provincial limits, the second probably so: Wawanesa, 20 miles southeast of Brandon (Groh, 1932); Manitoba-Ontario boundary area, around lakes (Simpson, 1941). First report: "Ontario boundary area" [Lowe, 1943; the Wawanesa specimen is cited by Groh, 1944].

Temperate American: Wash. and s. Sask. [Groh, Canadian Field-Naturalist 58: 17. 1944] to sw. Que., s. to Calif. and Fla.

3. **C. schweinitzii** Torr.

Sandy prairie and sandhills of southwestern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandhills, (Scoggan, 1953). Earliest collection seen: Aweme, about 20 miles southeast of Brandon, sandhills (Fletcher, 1905). First report: Jackson *et al.* [1922; but scarcely "lakes and streams"].

Temperate American: Sask. to sw. Que., s. to N.M., Tex., Ind., and Pa.

4. **C. houghtonii** Torr.

The following specimens have been seen: Victoria Beach (Jackson, 1921; Simpson, 1935; sandy pine woods, Breitung, 1949); Marchand, about 40 miles southeast of Winnipeg, very loose sand (Breitung, 1949); Brokenhead, about 30 miles northeast of Winnipeg (dry sandy soil, pines, A. & D. Löve, 1952; roadside clearing, Scoggan, 1953). First report: Jackson *et al.* [1922].

Temperate eastern American: Man. to sw. Que., s. to Ia. and Pa.

*C. filiculmis* Vahl is reported from Fort Garry by Schultz [1861] and from Winnipeg by Bourgeau, in Palliser [1863], but there is no other indication of the presence of the species in Manitoba.

## 2. Eleocharis R. Br.

### (Spike-Rush)

[*See* Svenson, 1929; 1932; 1934; 1937; 1939.]

1. Tubercle not forming a distinct cap on the 3-angled achene; culms capillary, 1-3 dm. tall ........ 1. *E. pauciflora*
1. Tubercle distinct.
  2. Achenes lenticular or biconvex; stigmas 2.
    3. Tubercle very depressed along summit of the achene; culms tufted, annual ........ 2. *E. engelmannii* var. *monticola*
    3. Tubercle mostly higher than broad, distinctly articulated with achene; plants perennial by strong rhizomes.
      4. Sterile basal scale 1, encircling the culm.
        5. Tubercle narrowly conical, less than 0·5 mm. broad at base; achenes not more than 1 mm. wide; spikelets closely many-flowered ........ 3. *E. calva*
        5. Tubercle often as broad as high, 0·6-1 mm. broad at base; achenes 1-1·4 mm. wide; spikelets loosely few-flowered ........ 4. *E. uniglumis*
      4. Sterile basal scales 2 or 3; spikelets up to 2·5 cm. long; culms up to 1 m. tall and 3 mm. thick.
        6. Tubercle much longer than broad ........ 5. *E. palustris*
        6. Tubercle as broad as or broader than long ........ 6. *E. smallii*
  2. Achenes 3-angled; stigmas 3.
    7. Plants forming dense mats; achenes with several longitudinal ridges.
      8. Culms soft, fertile ........ 7. *E. acicularis*
      8. Culms rigid, usually entirely submersed and sterile ........ 7a. *E. acicularis* var. *submersa*

7. Plants not mat-forming; achenes without prominent longitudinal ridges.
   9. Surface of golden to brown achene merely wrinkled or granular-roughened; culms flattened and wiry; rhizomes 2-4 mm. thick..................8. *E. compressa*
   9. Surface of yellow to orange achene with many prominent transverse bands; culms angled; rhizomes 1-3 mm. thick........................9. *E. elliptica*

1. **E. pauciflora** (Lightf.) Link

The following specimens have been seen: Churchill (Gillett, 1948); Gillam, about 165 miles south of Churchill (Schofield, 1950); Gypsumville, about 125 miles north of Portage la Prairie, wet weathered gypsum at quarry (Scoggan, 1951). First report: marshes at the base of Porcupine Mountain [Macoun, 1888]. The foregoing specimens are referable to var. *fernaldii* Svenson, differing from the main form in its smaller achenes and spikelets.

Subarctic circumpolar: central Alaska to Great Bear L., n. Man., James Bay, and Nfld.; s. Greenland; Iceland; Eurasia. A map of the distribution, on which the above Manitoba stations should be indicated, is given by Svenson [1934, map 1]. An interpretation of the American distribution (with map) is presented by Böcher [Journal of Ecology 39: 388-391. 1951].

2. **E. engelmannii** Steud. var. **monticola** (Fern.) Svenson (*E. monticola* Fern.)

The following is the only specimen seen: Killarney, near Turtle Mountain, muddy place along railroad (Macoun, 1896). First report: Killarney [Svenson, 1929]. Our plant, with achene-bristles lacking or rudimentary, is forma *leviseta* (Fern.) Svenson.

Temperate western American: Wash. to s. Man., s. to Calif., N.M., and N.D. A map of the area of the inclusive species is given by Svenson [1939, map 45].

3. **E. calva** Torr.

The following specimens have been seen: Muskeg Creek, Lake Winnipeg (Macoun, 1884); Gimli, about 45 miles north of Winnipeg (Dudley, 1941); Lac du Bonnet, about 50 miles northeast of Winnipeg, shore (Breitung, 1949). First report: Grand Beach and Brandon [Fernald & Brackett, Rhodora 31: 69. 1929].

(Subarctic-)temperate American: sw. Mack. and n. Sask. to James Bay and e. Que., s. to N.M., Tenn., and Va. A map of the greater part of the distribution is given by Svenson [1939, map 65].

4. **E. uniglumis** (Link) Schultes

Known in Manitoba from the following localities: Brandon, boggy place (Macoun, 1896); Churchill (Polunin, 1936; Duman, 1938); Grand Rapids, near the northwest side of Lake Winnipeg, swampy ground (Scoggan, 1948); York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949). First report: Brandon [Fernald & Brackett, Rhodora 31: 72. 1929].

Subarctic circumpolar: central Alaska to n. Alta., n. Man., James Bay, and s. Lab., s. to Oreg., Wyo., N.D., and Nfld.; s. Greenland; Iceland; Eurasia.

5. **E. palustris** (L.) R. & S. (Incl. var. *major* Sonder)

Wet ground and shallow water almost throughout the province. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Brandon, pool (Macoun, 1896). First report: Dufferin, near Carman, and Souris River [Dawson, 1875].

Subarctic circumpolar: central Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, s. Lab., and Nfld., s. to Calif., Utah, Ia., and Pa.; s. Greenland; Iceland; Eurasia. A map of the greater part of the American distribution is given by Svenson [1939, map 64].

6. **E. smallii** Britt.

Known in Manitoba only from the following localities: Grand Beach (Malte, 1918); Churchill (Buller, 1939; Gillett, 1948, "bed of dried up pool on rock ridge", the sheet annotated by Svenson as "very characteristic material"). First report: the present publication.

(Subarctic-)temperate eastern American: n. Man. to James Bay and Nfld., S. to Mo., Ind., and Va. A map of the greater part of the distribution is given by Svenson [1939, map 66]. Gleason [1952] prefers to consider the species as an extreme of the foregoing one.

7. **E. acicularis** (L.) R. & S.

Wet ground and shallow water almost throughout the province except the extreme north. Northernmost collection: Cochrane River, lat. 58°02′ N., wet sand (Baldwin, 1951). Earliest collection seen: Portage la Prairie (Macoun & Herriot, 1906). First report: Red River, open prairie swamp [Dawson, 1875].

Subarctic circumpolar: n. Alaska, Mack. R. Delta, and Great Bear L. to central Keewatin, n. Que., s. Lab., and Nfld., s. to Calif. and Fla.; n. Mex.; sw. Greenland; Iceland; Eurasia. A map of the greater part of the American distribution is given by Svenson [1939, map 55].

Forma *inundata* Svenson, with culms submersed and sterile, has been collected at Boissevain, near Turtle Mountain (Scoggan, 1950, wet roadside ditch).

7a. **E. acicularis** (L.) R. & S. var. **submersa** (Nilss.) Svenson

This variety was collected in deep water of Cochrane River, north of Reindeer Lake, by Baldwin in 1951. First report: Cochrane River [Baldwin, 1953].

Range not known, but probably common throughout the northern area of the main form.

8. **E. compressa** Sulliv. (*E. acuminata* of auth., not (Muhl.) Nees)

The following specimens have been seen: Porcupine Mountain, "marshes and river or lake margins" (Macoun, 1881); Stony Mountain, near Winnipeg, meadow (Macoun, 1896); Melita, moist prairie (Scoggan, 1953). First report: Forrest, near Brandon [Svenson, 1932; based upon a Macoun collection bearing the same collection number as the foregoing Stony Mountain sheet]. The basis of reports of *E. acuminata* in Manitoba.

Temperate American: B.C. to w. Que., s. to Colo., Tex., Ala., and Ga. A map of the greater part of the distribution is given by Svenson [1939, map 31].

9. **E. elliptica** Kunth (*E. capitata* (L.) R. Br. var. *borealis* Svenson)

Specimens have been seen from the following localities: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873); Red Deer River, about lat. 53° N., wet bogs (Macoun, 1881); Grand Beach (Malte, 1918); Victoria Beach (Jackson, 1921); North Kildonan, Winnipeg (Denike, 1941). First report: Red Deer Lake [Svenson, 1932; as *E. capitata* var. *borealis*].

(Subarctic-)temperate American: s. B.C. to James Bay and Nfld., s. to Mont., Ia., and Pa. A map of the distribution is given by Svenson [1939, map 29]. Reports of *E. tenuis* (Willd.) Schultes for the province are mostly referable to this species. *E. tenuis* is a southeastern species.

## 3. RHYNCHOSPORA Vahl

## (Beak-rush)

1. **R. capillacea** Torr.

Known in the province only from Birds Hill, near Winnipeg, where it was collected in a bog by Denike in 1943. The specimen is referable to forma *leviseta* (Hill) Fern., with smooth achene-bristles. First report: the present publication.

(Subarctic-)temperate American: Sask. to Nfld., s. to S.D., Mo., Tenn., and Va. A map of the area is given by Gale [Rhodora 46: 132. 1944, map 11], on which the Manitoba station should be indicated.

## 4. SCIRPUS L.

## (Bulrush)

1. Involucre none or merely the modified outer scale of the terminal solitary spikelet or spike.
  2. Spikelet solitary, 3·5-7 mm. long; achenes sessile, short-beaked, subtended and exceeded by slender bristles.
    3. Bristles barely longer than the achene; culms round in cross-section, wiry, smooth, very densely cespitose ........................... 1. *S. cespitosus* var. *callosus*
    3. Bristles 2-3 cm. long, silky and conspicuous; culms triangular, rather weak, scabrous above, with horizontally creeping rhizomes.................... 2. *S. hudsonianus*
  2. Spikelets crowded into a terminal compound spike 1-2 cm. long; scales dark reddish-brown, acuminate, folded; achenes stipitate, long-beaked; bristles wanting or very short; plant of saline or brackish marshes, with extensively creeping rhizomes........................................................................ 3. *S. rufus*

1. Involucre consisting of 1-many mostly leaf-like bracts.

4. Involucre a single firm erect bract, appearing to be a continuation of the culm; culms naked or leafy only toward base.

5. Spikelets dark reddish-brown, strongly overlapping in two vertical rows of the compound spike; achenes long-beaked, stipitate; bristles wanting or very short .......... 3. *S. rufus*

5. Spikelets straw-yellow to brown, spreading in clusters, these either sessile or terminating divergent rays of the inflorescence; achenes sessile; bristles present.

6. Spikelets solitary or in a sessile cluster; culms 3-angled.

7. Rhizomes stout and hard, dark brown; leaves and involucral bract sharp-pointed; upper leaf-sheaths closed, with firm concave inner band at summit; achenes 2·5-3 mm. long, minutely beaked, exceeding the bristles.

8. Style normally 2-cleft; leaves mostly 1 or 2.............. 4. *S. americanus*

8. Style normally 3-cleft; leaves usually 3 or more.......................... 4a. *S. americanus* var. *polyphyllus*

7. Rhizomes soft and weak, brownish; leaves and involucral bract obliquely round-tipped; upper leaf-sheaths open or readily splitting, with thin fragile inner band; stigmas 3; achenes 3·2-4 mm. long, long-pointed, shorter than the bristles.............................. 5. *S. torreyi*

6. Spikelets mostly terminating divergent rays of the inflorescence; culms round in cross-section.

9. Culms soft and easily compressed; scales subglabrous, scarcely spotted, the excurrent midrib greenish and conspicuous.................. 6. *S. validus*

9. Culms firm; scales red-spotted, more or less viscid-puberulent, the relatively inconspicuous midrib extended as a short point.................. 7. *S. acutus*

4. Involucre of 2 or more flat leaves; culms leafy.

10. Culms sharply 3-angled, springing from strong, tuberous, creeping rhizomes; spikelets relatively few, 1-4 cm. long; scales long-awned.

11. Achenes sharply and equally 3-angled, 4-5 mm. long; bristles firm and persistent; leaves 0·7-2 cm. broad; culms 0·7-2 m. high........... 8. *S. fluviatilis*

11. Achenes lenticular or obscurely and bluntly 3-angled, 2·8-4 mm. long; bristles weak, soon deciduous; leaves 0·5-1·5 cm. broad; culms 0·3-1·5 m. high.......... 9. *S. paludosus*

10. Culms obtusely 3-angled or roundish, from close leafy crowns; spikelets very numerous, 2-8 mm. long.

12. Bristles downwardly barbed, short; thick scaly stolons present.

13. Leaf-sheaths red-tinged at base, smooth or barely nodulose when dry; styles usually 2-cleft; bristles barbed nearly to base.................. 10. *S. microcarpus* var. *rubrotinctus*

13. Leaf-sheaths uniformly greenish; styles usually 3-cleft; bristles barbed only above the middle........................ 11. *S. atrovirens* var. *pallidus*

12. Bristles smooth, curly, conspicuously exserted from the scales; plants tufted, non-stoloniferous.................................. 12. *S. cyperinus*

1. **S. cespitosus** L. var. **callosus** Bigel. (subsp. *austriacus* (Palla) Asch. & Graebn.)

The following Manitoba specimens have been seen: Pine Creek, near Carberry east of Brandon, bogs (Macoun & Herriot, 1906); Delta, south end of Lake Manitoba (Jackson, 1921); Gillam, about 165 miles south of Churchill (Schofield, 1950); Churchill (Porsild, 1930; Simpson, 1942); Nejanilini Lake, lat. 59° 22′ N., isolated black spruce – larch stand (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., wet sedge meadow (Baldwin, 1951); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Baralzon and Nejanilini lakes [Scoggan, 1952]; basis of earlier reports of the main form from York Factory by Bell [1881] and from Porcupine Mountain by Macoun [1888].

(Arctic-)subarctic circumpolar: n. Alaska and n. Mack. to central Keewatin, s. Baffin I., n. Lab., and Nfld., s. to Utah, Mont., Minn., Tenn., and N.C.; southern half of Greenland; Iceland; n. Eurasia. The main form is a plant of lowland Europe.

2. **S. hudsonianus** (Michx.) Fern. (*Eriophorum alpinum* L.)

Swampy ground and shallow water throughout the province except the southwestern section and the extreme north. Northernmost collection: Churchill (Jackson, 1928; Polunin, 1936). Earliest collection seen: the Jackson specimen from Churchill. First report: in bogs along Porcupine Mountain [Macoun, 1888].

Subarctic circumpolar: s. Alaska, Great Slave L., and n. Man. to central Lab. and Nfld., s. to Mont., Minn., and N.E.; n. Eurasia.

3. **S. rufus** (Huds.) Schrad.

Specimens have been seen from the following localities: Churchill (Macoun, 1910); Red Deer River, brackish marshes (Macoun, 1881); Delta, south end of Lake Manitoba (Jackson, 1921). First report: "Around salt springs, about a mile up Red Deer River, at the head of Lake Winnipegosis, lat. 53°" [Macoun, 1888].

(Subarctic-)temperate circumpolar: s. Alaska and sw. Mack. to n. Man., James Bay, and Nfld., s. to s. Sask., s. Man., and N.S.; Eurasia. The American plant has been segregated as var. *neogaeus* Fern., chiefly on the basis of its purportedly longer achenes.

4. **S. americanus** Pers. (*S. pungens* Vahl) Chair-maker's Rush

Shallow water throughout the southern half of the province. Northernmost collection: Wabowden, H. B. Ry., about 125 miles east of Flin Flon (Gillett, 1948). Earliest collection seen: "Shoal Lakes, Man." (Macoun, 1872). First report: Brandon, salt marshes [Macoun, 1888].

Subarctic circumpolar: west central Alaska; B.C. to central Man., James Bay, and Nfld., s. to Calif. and Fla.; Eurasia.

4a. **S. americanus** var. **polyphyllus** (Boeckl.) Beetle

Known in Manitoba only from Macgregor, where it was collected by Macoun and Herriot in 1906. First report: Macgregor [Beetle, Amer. Journ. Bot. 30: 399. 1943].

Probably more or less common throughout the range of the species.

5. **S. torreyi** Olney

The following specimens have been seen: Delta, south end of Lake Manitoba (Jackson, 1921); Victoria Beach (Simpson, 1940). First report: Lake Winnipeg [Jackson *et al.*, 1922].

Temperate eastern American: s. Man. to N.B., s. to S.D., Mo., Ky., and Pa.

6. **S. validus** Vahl (Incl. var. *creber* Fern.) Soft-stem Bulrush

Marshes and shallow water throughout the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Grassy Narrows, Lake Winnipeg (between Hecla I. and the mainland) (Macoun, 1884). First report: "Winnipeg and N. W. Angle Road" [Dawson, 1875]; the basis of early citations of *S. lacustris* from the province.

Subarctic American: s. Alaska and Great Bear L. to n. Man., James Bay, and Nfld., s. to Calif., Tex., Mo., Tenn., and Ga.

7. **S. acutus** Muhl. (*S. occidentalis* (Wats.) Chase) Hard-stem Bulrush

Marshes and shallow water throughout the southern third of the province (although further studies of this and the preceding species are necessary to clarify their respective areas). Northernmost collection: Spruce Island, Lake Winnipegosis, east of Red Deer Lake (Bondar & McLeod, 1953). Earliest collection seen: Delta, south end of Lake Manitoba (Jackson, 1921). First report: Lake Winnipegosis [Jackson *et al.*, 1922; as *S. occidentalis*].

(Subarctic-)temperate American: B.C. and central Alta. and central Sask. to Nfld., s. to Calif., Tex., Ind., and Pa.

8. **S. fluviatilis** (Torr.) Gray

Specimens have been seen from the following localities: Winnipeg, swamp (Neatby, 1929); Jessica Lake, Whiteshell Forest Reserve (Hinks, 1939); Jordon, southwest of Winnipeg, ditch (Lowe, 1942); Arborg, about 70 miles north of Winnipeg, swampy ground (Scoggan, 1951); Ste. Elizabeth, south of Winnipeg (A. & D. Löve, 1953). First report: Assiniboine River south of Shilo, near Brandon [Lowe, 1943].

Temperate American: Sask. to N.B., s. to Calif., N.M., Kans., and Pa.

9. **S. paludosus** Nels. (*S. maritimus* L. var. *paludosus* (Nels.) Gl.) Bayonet-grass

Marshes and shallow water throughout the southern half of the province. Northernmost collection seen: The Pas (Krivda, 1951). Earliest collection seen: "Shoal Lakes, Man.", presumably the group northwest of Winnipeg (Macoun, 1872). First report: Nelson River [Jackson *et al.*, 1922]; the report of *S. maritimus* from near Turtle Mountain by Dawson [1875] is referable here, as is also the citation of *S. campestris* by J. M. Macoun [1897] from Red River.

(Subarctic-)temperate western American: s. Alaska; s. B.C. and n. Alta. to central Man. and Minn., s. to Calif. and Mo.; replaced in eastern North America by var. *atlanticus* Fern.

10. **S. microcarpus** Presl var. **rubrotinctus** (Fern.) Jones (*S. rubrotinctus* Fern.)

Damp soil, marshes, and shores throughout the southern four-fifths of the province. Northernmost collection: Reindeer Lake, lat. 57° 16′ N., river shore (Baldwin, 1951). Earliest collection seen: Brandon, ravine (Macoun, 1896). First report: Lake Winnipeg Valley [Fernald, Rhodora 2: 21. 1900].

(Subarctic-)temperate American: ne. Alta. and n. Man. to James Bay, s. Lab., and Nfld., s. to s. Alta., Neb., Ill., and W. Va.

The main form, a more western plant with broader leaves and green sheaths, is reported from eastern and northern Manitoba by Lowe [1943], but all material seen is referable to the variety.

11. **S. atrovirens** Willd. var. **pallidus** Britt. (*S. pallidus* (Britt.) Fern.)

Damp or wet soils of southern Manitoba. Northernmost collection seen: Grand Beach, about 50 miles northeast of Winnipeg (Malte, 1918). Earliest collection seen: Brandon, ravine (Macoun, 1896). First report: Fernald [Rhodora 8: 163. 1906].

Temperate western American: Wash. to Man., s. to Ariz., Tex., and Mo.

The main form was reported from Winnipeg as early as 1863 by Bourgeau [in Palliser, 1863], and as far north as "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" by Bell [1880], but all material seen appears referable to the foregoing variety.

12. **S. cyperinus** (L.) Kunth (Incl. *S. atrocinctus* Fern., *S. eriophorum* Michx., and *S. pedicellatus* Fern.) [*See* Gleason, 1952, p. 276].

Damp or wet ground almost throughout the province. Northernmost collection: Reindeer Lake, lat. 57° 48′ N., sandy beach (Baldwin, 1951). Earliest collection seen: Shoal Lake, on the Ontario boundary (Scott, 1920). First report: "Winnipeg and N. W. Angle Road" [Dawson, 1875; as *S. eriophorum*].

(Subarctic-)temperate American: ne. Alta., the Great Lakes region, s. Lab., and Nfld., s. to Wash., Okla., and Fla.

## 5. ERIOPHORUM L.

### (Cotton-grass)

[*See* Fernald, 1905; Hultén, 1942.]

1. Spikelets more than one, on spreading or drooping peduncles, the inflorescence subtended by one or more leafy bracts.
   2. Involucral bract solitary; leaves 1-1·5 mm. wide, channelled to base.
      3. Sheath of upper leaf longer than the blade .......................... 1. *E. gracile*
      3. Sheath of upper leaf shorter than the blade .......................... *E. tenellum*
   2. Involucral bracts 2 or more; leaves 1·5-8 mm. wide, flat at least below the middle.
      4. Spikelets mostly crowded, their greenish or straw-coloured scales with several strong ribs; stamen solitary .......................................... *E. virginicum*
      4. Spikelets mostly loosely peduncled, their greenish to blackish scales with 1 prominent rib; stamens 3.
         5. Upper leaf-sheaths not dark-girdled at summit; leaves flat except at tip, 2-6 mm. wide; midrib of scales extending to tip; anthers 1-1·3 mm. long ............................................................ 3. *E. viridi-carinatum*
         5. Upper leaf-sheaths dark-girdled at summit; midrib of scales not extending to tip; anthers 2·5-5 mm. long.
            6. Leaves 1·5-4 mm. wide; culms 2-6 dm. high .............. 2. *E. angustifolium*
            6. Leaves 4-8 mm. wide; culms 3-9 dm. high ..... 2a. *E. angustifolium* var. *majus*

1. Spikelets solitary, erect, not subtended by a leafy involucre; culm-leaves reduced to mostly bladeless sheaths.
  7. Plants with stolons, the culms mostly solitary.
    8. Anthers 0·5-1 mm. long; fruiting heads globose to subglobose, 2-2·5 cm. long; scales attenuate, with slightly paler narrow margins; bristles bright white. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4. *E. scheuchzeri*
    8. Anthers 1·5-3 mm. long; fruiting heads globose to obovoid, 2·5-4 cm. long; scales with broad whitish margins.
      9. Bristles (in our plant) white; culms slender, 1-5 dm. high. . . . . .5. *E. chamissonis*
      9. Bristles rust-tinged; culms 4-6 dm. high, 2-4 mm. thick at base. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .5a. *E. chamissonis* var. *aquatile*
  7. Plants without stolons, densely tufted.
    10. Scales with broad whitish margins, the basal ones divergent or reflexed at maturity; upper sheaths conspicuously inflated above; anthers 1-2 mm. long; bristles bright white. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .6. *E. spissum*
    10. Scales without conspicuous pale margins, the basal ones rarely reflexed.
      11. Bristles brownish-tinged; sheaths scattered on the culm, the upper scarcely inflated; anthers 1-2 mm. long. . . . . . . . . . . . . . . . . . . . . . . .7. *E. brachyantherum*
      11. Bristles bright white; sheaths mostly borne below middle of culm, the uppermost conspicuously inflated above; anthers 0·7-1 mm. long; plants of the Hudson Bay region.
        12. Scales lead-colour. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .8. *E. callitrix*
        12. Scales straw-colour. . . . . . . . . . . . . . . . . . . . . . . . .8a. *E. callitrix* var. *moravium*

1. **E. gracile** Koch

The following collections have been seen: Sidney, about 40 miles east of Brandon (Macoun & Herriot, 1906); Pine Creek, near Sidney (Macoun & Herriot, 1906); Norway House, damp open woods (Scoggan, 1948); Hill Lake, north of Lake Winnipeg, heath bog (Scoggan, 1948); Wekusko Lake, about 90 miles northeast of The Pas, marshy ground (Scoggan, 1949); Gillam, about 165 miles south of Churchill (Schofield, 1950); Churchill (Jackson, 1928); Reindeer Lake, lat. 57° 52′ N., marsh (Baldwin, 1951). First report: York Factory [Bell, 1881]. Probable basis of the report of *E. triquetrum* from Carberry by Christy [1887].

Subarctic circumpolar: s. Alaska and central Mack. to n. Man., James Bay, s. Lab., and Nfld., s. to n. Calif., Neb., and Pa.; Eurasia.

2. **E. angustifolium** Honckeny (*E. polystachion* of Am. auth., not L.)

Wet ground, bogs, and shores throughout the province. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: Jackson *et al.* [1922]; basis of earlier citations of *E. polystachion* from the province.

(Arctic-)subarctic circumpolar: n. coast of Alaska and Yukon to Great Bear L., southern Baffin I., n. Lab., and Nfld., s. to Oreg., N.M., Ill., and N.E.; s. Greenland; Iceland; Spitsbergen; n. Eurasia.

2a. **E. angustifolium** var. **majus** Schultz

The following collection appears to be referable here: Brochet, Reindeer Lake, lat. 57° 53′ N., marsh (Baldwin, 1951). First report: Spruce Woods Forest Reserve, larch swamp [Shimek, 1927].

Subarctic circumpolar: Alaska to Lab., s. to Oreg., Colo., Ind., and N.E.; s. Greenland; Eurasia.

3. **E. viridi-carinatum** (Engelm.) Fern. (*E. latifolium* of Am. auth., not Hoppe)

Swampy ground and bogs throughout the southern three-quarters of the province. Northernmost collection: York Factory, black spruce muskeg (Scoggan, 1949). There is in the National Herbarium of Canada a specimen purportedly from Churchill (Gardner, No. 31, 1930), but the same number is listed by Gardner (1937) as having been collected along the railway between The Pas and Flin Flon. Earliest collection seen: Sewell (now Camp Hughes), east of Brandon, tamarack swamp (Macoun, 1896). First report: Sewell [Fernald, Rhodora 7: 90. 1905]; basis of the citation of *E. latifolium* from "Between Badger Creek and Turtle Mountain" by Dawson [1875].

Subarctic American: central Yukon to central interior Lab. and Nfld., s. to s. B.C., Ia., O., and N.E.

*E. tenellum* Nutt. is listed by Jackson *et al.* [1922] and Lowe [1943] from northern Manitoba, but the single specimen seen (collected at Churchill by Jackson in 1928) is too fragmentary for precise determination, and is probably referable to *E. gracile.*

*E. virginicum* L. is also listed by both Jackson and Lowe, and is attributed to Manitoba in the range given by Gleason [1952]. No supporting specimens have been seen, however, and the species must be excluded from our flora for the present.

4. **E. scheuchzeri** Hoppe (*E. capitatum* Host)

Known in Manitoba from the following localities: Churchill (several collections, the first by Macoun in 1886); York Factory, landslide gully and clay-gravel beach (Scoggan, 1949); Gillam and vicinity, about 165 miles south of Churchill (Taverner, 1936; Schofield, 1950); Nejanilini Lake, lat. 59° 22′ N., small isolated stand of stunted black spruce and tamarack (Scoggan & Baldwin, 1950). First report: "Coast between York Factory and Churchill" [Rae, 1850].

Arctic circumpolar: n. coast of Alaska and throughout the Can. Arct. Arch. to n. Lab., s. to s. B.C., James Bay, and n. Nfld.; Greenland; Iceland; Spitsbergen; n. Eurasia.

Var. *tenuifolia* Ohwi, separated from the main form on the basis of culm and leaf dimensions, is apparently represented by a specimen collected at Churchill by Hyde in 1949. It seems scarcely worthy of varietal status.

5. **E. chamissonis** Mey. (Incl. *E. russeolum* Fries)

Wet soil and bogs almost throughout the province. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: Porcupine Mountain, bogs and marshes (Macoun, 1881). First report: the present publication.

Arctic circumpolar: n. coast of Alaska and Mack. to Baffin I., n. Lab., and n. Nfld., s. to Wash., Ida., Wyo., Minn., Ont., and N.S.; n. Eurasia. An approximate map of the total distribution is given by Löve [Botaniska

Notiser, p. 105, 1948]. For a somewhat different treatment of this and the following variety, also with maps, see Raymond [Svensk Botanisk Tidskrift 48: 65-82. 1954].

Forma *albidum* (Nylander) Fern. (*E. russeolum* var. *leucothrix* (Blomgr.) Hult.) is the common, and perhaps exclusive, Manitoba representative of the species. Basis of the report of *E. capitatum* by Macoun [1888] from Porcupine Mountain.

5a. **E. chamissonis** var. **aquatile** (Norman) Fern. (*E. medium* Anders.) [*See* Hultén, 1942, p. 282.]

Known in Manitoba from only the following locality: Whiteshell Forest Reserve, wet ground (Scoggan, 1951). First report: the present publication.

Range uncertain, but perhaps more or less throughout that of the main form.

6. **E. spissum** Fern. (*E. vaginatum* L. subsp. *spissum* (Fern.) Hult.)

Acid bogs throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: Churchill [Ritchie, 1956]; probable basis of reports of *E. vaginatum* by Macoun [1888] and Burman [1910]; and *E. callitrix* by Jackson *et al.* [1922] and Lowe [1943].

Arctic American: n. coast of Alaska to n. Baffin I., n. Lab., and Nfld., s. to Alta., the Great Lakes region, and N.E.

7. **E. brachyantherum** Trautv. (*E. opacum* (Björnstr.) Fern.)

Wet or swampy ground almost throughout the province except the southwestern prairie region. Northernmost collection: Churchill (several collections, the first by Porsild in 1930). Earliest collection seen: the foregoing Churchill specimen. First report: Lowe [1943]; basis of the report of *E. virginicum* var. *opacum* from the province by Jackson *et al.* [1922], presumably in error for *E. vaginatum* var. *opacum.*

Arctic circumpolar: n. coast of Alaska and Mack. to central Baffin I. and Nfld., s. to s. B.C. and the Great Lakes region; n. Eurasia. A map of the American area, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XVII]. A map of the circumpolar distribution is given by Raymond [1950, fig. 17].

8. **E. callitrix** Cham.

Known in Manitoba only from Churchill, where it was first collected by Jackson in 1928. First report: Burman [1910; but probably based upon *E. spissum* Fern.].

Arctic American: n. coast of Alaska and Mack., Can. Arct. Arch., n. Lab., and Nfld., s. to Great Bear L., n. Man., and James Bay; e. Greenland; e. Asia.

8a. **E. callitrix** var. **moravium** Raymond

Known in Manitoba only from the type locality, Churchill, where it was collected on "wet peaty meadow on rocky tundra near shore" by Dore in 1949. First report: Churchill [Raymond, Mém. Jard. Bot. Montréal, No. 23: 7. 1951].

Range uncertain, but reported also from Great Bear L. and Lab.

### 6. KOBRESIA Willd.

1. **K. simpliciuscula** (Wahl.) Mack. (*K. caricina* Willd.)

Known in Manitoba only from Churchill, where it was first collected by Porsild in 1930. First report: the present publication.

Arctic circumpolar: n. coast of Alaska and Mack., Can. Arct. Arch., n. Lab., and Nfld., s. to Alta., James Bay, and Anticosti I., Que., and the mts. of Colo.; Greenland; n. Eurasia.

### 7. CAREX L.

(Sedge)

[*See* Mackenzie, 1931; 1935; 1940.]

1. Spike solitary, bractless (or in *C. scirpoidea*, often with a dark-auricled bract at base or a short distance below).
  2. Achenes lenticular; stigmas 2; perigynia glabrous.
    3. Spike staminate above, pistillate below; pistillate scales rounded at apex; culms densely tufted, purple at base; plant of the Hudson Bay and northern regions.......................................................... 1. *C. capitata*
    3. Spike wholly staminate or wholly pistillate, or staminate above and pistillate below; pistillate scales acute or acuminate; culms solitary or few from filiform creeping stolons................................................28. *C. gynocrates*
  2. Achenes triangular in cross-section; stigmas 3.
    4. Plant dioecious, the spikes wholly staminate or wholly pistillate; perigynia pubescent; scales purple to castaneous.
      5. Scales very narrowly hyaline-margined......................62. *C. scirpoidea*
      5. Scales with broad white hyaline margins....62a. *C. scirpoidea* var. *scirpiformis*.
    4. Plants monoecious, the spike staminate above, pistillate below.
      6. Staminate scales with margins united nearly to the middle; perigynia subalternate, beakless; leaves very lax and soft, 0·5-1·3 mm. wide; culms flaccid, densely cespitose to substoloniferous..................................51. *C. leptalea*
      6. Staminate scales with margins free to base; leaves firm.
        7. Perigynia slenderly subulate, soon reflexed and falling; pistillate scales deciduous; style continuous with achene and persistent at its summit.
          8. Perigynia with a slender process (the rachilla) projecting from the orifice and exceeding the styles; lowest leaf-sheaths blade-bearing; plant of the Hudson Bay region..............................111. *C. microglochin*
          8. Perigynia without rachilla; lowest sheaths bladeless......112. *C. pauciflora*
        7. Perigynia narrowly ellipsoid to obovoid, persistent, not reflexed; styles deciduous.
          9. Culms densely cespitose, forming dense tussocks; leaves filiform or acicular, involute, wiry, their old brown sheaths persistent; perigynia minutely pubescent; plant of dry prairie habitats....................54. *C. filifolia*
          9. Culms solitary or few together from tough cord-like rhizomes; leaves flat; perigynia glabrous.

10. Pistillate scales pale brown, acuminate, early deciduous; perigynia castaneous to blackish, highly lustrous; leaves 1-1·5 mm. wide........ ..................................................55. *C. obtusata*

10. Pistillate scales with brown to purple centres and pale hyaline rounded summit; perigynia straw-colour or brownish, barely lustrous; leaves 1-3 mm. wide; plant of the Hudson Bay region........................ ..................................................66. *C. rupestris*

1. Spikes 2 or more.

11. Achenes lenticular or plump, not triangular in cross-section; stigmas 2.

12. Spikes of two kinds, the terminal staminate (at least below), the lower entirely or mostly pistillate, peduncled (or subsessile and crowded in *C. rufina*).

13. Style continuous with the achene and of the same bony texture, persistent; perigynia nearly nerveless, slightly exceeding the blunt purplish-black scales, the short beak subentire; culms from slender purplish rhizomes; plant of the Hudson Bay and northern regions.................................... ........................................118. *C. saxatilis* var. *miliaris*

13. Style jointed with achene, soon withering; perigynia beakless or with short entire beak.

14. Bracts sheathing; perigynia pulverulent or golden-yellow at maturity; leaves 1-4 mm. wide.

15. Perigynia sparingly serrulate above, with beaks 0·1-0·2 mm. long; scales purplish-brown; terminal spike pistillate above; plant of the northern regions....................................69. *C. rufina*

15. Perigynia not serrulate, beakless or nearly so.

16. Lowest bract short-sheathing, shorter than to little exceeding the inflorescence, with broad black basal auricles; perigynia glaucous-white, densely granular-roughened; scales purplish-black; spikes crowded, the terminal one strongly pistillate above the staminate base; plant of the Hudson Bay region........................ ..............................................70. *C. bicolor*

16. Lowest bract long-sheathing, leaf-like and usually exceeding the inflorescence, without basal auricles; spikes distant to approximate.

17. Terminal spike pistillate above; scales brown to purplish, their rounded summits much shorter than the white-pulverulent, dry, rather obscurely nerved perigynia...................... ..........................................71. *C. garberi*

17. Terminal spike mostly staminate throughout; scales whitish to orange-brown, short-pointed; perigynia golden-yellow or brownish, fleshy, coarsely ribbed........................... ..........................................72. *C. aurea*

14. Bracts nearly or quite sheathless; perigynia neither pulverulent nor golden-yellow at maturity; leaves 1-12 mm. or more broad.

18. Scales tipped with long rough awns, much exceeding the perigynia; pistillate spikes nearly all peduncled; achenes usually with a deep indentation on one side near middle.

19. Culms from elongate, rope-like, scaly but leafless stolons; plant of the saline shore of Hudson Bay............................... ..........................................109. *C. paleacea*

19. Culms in stools, without elongate leafless stolons....108. *C. crinita*

18. Scales awnless, obtuse to acuminate, shorter than to slightly exceeding the perigynia; upper spikes mostly sessile.

20. Perigynia brown-nerved; achenes not indented near middle; median green band of scales about as broad as the brown or purplish margins; leaves 1-3 mm. broad, much overtopping the culms; stolons wanting.................................... ..........................................105. *C. lenticularis*

20. Perigynia nerveless or nearly so; culms from cord-like horizontal stolons.

21. Culms in dense clumps, mostly exceeding the leaves; pistillate spikes often staminate at apex; achenes not indented near middle........................107. *C. stricta* var. *elongata*

21. Culms solitary or few from small crowns, often surrounded at base by dried-up leaves of the previous year.

22. Achenes with a deep indentation on one side near the middle; plant of the Hudson Bay salt-marshes.......................................110. *C. salina* var. *subspathacea*

22. Achenes not indented.

Lowest bract usually shorter than the inflorescence; terminal staminate spike 0·5-2·5 cm. long; leaves dark green, smooth or nearly so; plant of the Hudson Bay and northern regions..............................104. *C. bigelowii*

Lowest bract usually equalling or over-topping the inflorescence; terminal staminate spike 2-5 cm. long; leaves scabrous on margins and nerves.

Leaves glaucous, equalling or exceeding the culms; staminate spikes usually 2 or more.....................................................106. *C. aquatilis*

Leaves green, mostly shorter than the culms; staminate spike usually solitary.......106a. *C. aquatilis* var. *stans*

12. Spikes essentially uniform, the lateral ones sessile.

23. Culms arising singly or few together from long-creeping slender or cord-like rhizomes; spikes androgynous (staminate at apex) (except *C. siccata*, with terminal spike usually pistillate above a prolonged staminate base, middle spikes staminate, lower spikes pistillate; and *C. douglasii*, with heads usually entirely staminate or pistillate).

24. Culms branching, the long prostrate ones of the previous year bearing erect culms from the axils of the old dried-up leaves; leaves narrow, involute; spikes few, crowded; bog species.....................................................9. *C. chordorrhiza*

24. Culms simple.

25. Perigynia wing-margined, at least above.

26. Perigynia 2·5-4·5 mm. long, their beaks one-fourth to one-third as long as the body; inner band of leaf-sheaths green-nerved nearly to summit; upper nodes of culm exserted from sheaths; rhizomes black; plant of damp or wet habitats..............7. *C. sartwellii*

26. Perigynia 5-6 mm. long, with narrow greenish margin, their beaks two-thirds as long as the body; leaf-sheaths much overlapping, their inner bands nerveless; rhizomes brown; plant of dry open soil..........................................8. *C. siccata*

25. Perigynia wingless or merely thin-edged.

27. Rhizomes black, stout; culms relatively tall, sharply triangular, normally rough above; leaves scabrous-margined.

28. Inner band of leaf-sheaths green-nerved nearly to summit; perigynia thin-edged to base, slenderly nerved on both faces, their beaks one-fourth to one-third as long as the body; leaves 2·5-4 mm. wide..........................7. *C. sartwellii*

28. Inner band of leaf-sheaths nerveless; perigynia scarcely thin-edged, slightly nerved on the back, the inner face nerveless, their beaks one-half as long as the body; leaves 1·5-3 mm. wide.........................................6. *C. praegracilis*

27. Rhizomes brown, slender; culms lower, obtusely triangular, normally smooth; leaves smooth, except toward apex.

29. Spikes usually entirely staminate or entirely pistillate on separate culms (heads dioecious), crowded but usually readily distinguishable; anthers very conspicuous, 3·5 mm. long; perigynia 3·5-4 mm. long, more or less strongly striate dorsally; stigma and styles very long..................4. *C. douglasii*

29. Spikes staminate at apex, pistillate below; styles short.

30. Plant of dry prairie habitats; culms erect, up to 4 dm. high; leaves 1-2 mm. wide, curved; perigynia essentially nerveless ..........................5. *C. stenophylla* var. *enervis*

30. Plants of the Hudson Bay region; culms less than 2 dm. high.

31. Perigynia nerveless on inner face, very obscurely striate dorsally; spikes 4-12, nearly indistinguishable, the terminal one with inconspicuous staminate portion; culms generally arching; leaves 1-2 mm. wide at base ......................................2. *C. maritima*

31. Perigynia 10-14-ribbed on each face; spikes usually 2-4, distinguishable at maturity, the terminal one with conspicuous staminate portion; culms erect; leaves 0·5 mm. wide.........................3. *C. dutillyi*

23. Culms from densely to loosely cespitose, the rhizomes sometimes short-prolonged but not long-creeping.

32. Spikes androgynous (No. 18, *C. disperma*, may be sought here).

33. Culms soft and flattening in drying, with concave sides, the sharp angles more or less winged, serrulate above; leaf-sheaths loose.

34. Perigynia ovate, 3-4 mm. long, stipitate, flat on the inner nerveless face, faintly brown-nerved dorsally, contracted into a beak about half as long as body, about equalling or little exceeding the brownish scales; leaves 3-6 mm. wide; inner band of leaf-sheaths dotted, unwrinkled..................................17. *C. alopecoidea*

34. Perigynia subulate-lanceolate, 4-5 mm. long, brown-nerved, tapering from broad base to long slender beak, much exceeding the pale scales; leaves 4-8 mm. wide; inner band of leaf-sheaths commonly cross-puckered, at least between the nerves.........16. *C. stipata*

33. Culms relatively firm, not flattening in drying; leaf-sheaths close.

35. Spikes 3-10, in simple, close or interrupted, heads; perigynia nerveless or lightly striate dorsally; sheaths not red-dotted ventrally.

36. Inflorescence densely capitate; perigynia 2-3 mm. long, the margins forming a raised border ventrally, the beak one-fourth to one-half the length of the body; leaves 2-4·5 mm. wide....................................*C. cephalophora*

36. Inflorescence elongate, interrupted.

37. Perigynia of nearly uniform texture, their margins not incurved; bracts with brown broad scarious bases; scales pale brown, strongly awned, covering the perigynia; leaves 1-2·5 mm. wide..................12. *C. hookerana*

37. Perigynia corky-thickened below the middle, the nerve-like margin inflexed; scales whitish, rounded or obtusish.

38. Broader leaves 1·8-3 mm. wide; culms stiffish, erect or suberect; lower spikes (6-)9-20-flowered; stigmas tightly coiled..............................11. *C. convoluta*

38. Broader leaves 0·8-2 mm. wide; culms weak and lax; lower spikes 5-12-flowered; stigmas not tightly coiled.... ......................................10. *C. rosea*

35. Spikes numerous in a more or less compound head, usually 2-several spikes on each lateral branch; perigynia dorsally nerved.

39. Scales long-awned; bracts setaceous, conspicuous; perigynia flat on inner face, yellowish-green or straw-colour; leaves 2-6 mm. wide; inner band of leaf-sheaths cross-puckered, not red-dotted..............................13. *C. vulpinoidea*

39. Scales not awned; bracts mostly short and inconspicuous or wanting; perigynia straw-colour to dark brown; leaves 1-3 mm. wide; inner nerveless band of leaf-sheaths often red-dotted, not cross-puckered.

40. Sheaths not copper-tinged at mouth; perigynia lustrous, blackish in age, soon divergent, mostly longer than the scales, slightly convex ventrally; heads dense..........................................................14. *C. diandra*

40. Sheaths strongly copper-tinged at mouth; perigynia dull, brownish in age, appressed and covered by the scales, flat on inner face; heads lax and open..........15. *C. prairea*

32. Spikes, at least the terminal, gynaecandrous (pistillate at apex) (except No. 18, *C. disperma*).

41. Perigynia at most thin-edged, corky-thickened at base; culms not hollow.

42. Perigynia 4·5-5·5 mm. long, with long slender bidentate beaks, closely appressed-ascending; scales pale, acuminate or short-cuspidate; leaves glaucous, 2-5 mm. wide.........30. *C. deweyana*

42. Perigynia 1·5-3·75 mm. long.

43. Perigynia white-puncticulate, with rounded margins, ascending or merely spreading-ascending, nearly beakless or with short subentire beak, soft in texture (except No. 18, *C. disperma*)..................................A. Section *HELEONASTES*

43. Perigynia not puncticulate, with thin margins, very spongy at base, spreading or reflexed at maturity, beaked.

44. Perigynia nerveless or weakly few-nerved at the base ventrally, the beak one-fourth to one-third the length of the body, shallowly bidentate..................29. *C. interior*

44. Perigynia slightly nerved on both faces, the beak about half as long as the body, sharply bidentate.......*C. sterilis*

41. Perigynia narrowly to broadly wing-margined, mostly with concave inner faces, not spongy-thickened at base, beaked; culms hollow...........................................B. Section *OVALES*

11. Achenes trigonous (triangular in cross-section); stigmas 3; terminal spike mostly entirely staminate, sometimes partly pistillate; at least some of the lateral spikes strictly pistillate, mostly peduncled.

45. Staminate scales with margins united at base, very tight; lower pistillate scales green and bract-like; achenes slightly depressed at summit; perigynia glabrous.

46. Perigynia 4·5-6 mm. long, empty at summit, tapering to a conical beak 2-3 mm. long; leaves deep-green, flat........................52. *C. backii*

46. Perigynia 4 mm. long, tightly filled by the achene, with beak 0·5-1 mm. long; leaves glaucous-green, with revolute margin.........53. *C. saximontana*

45. Staminate scales with margins free to base, loosely ascending; pistillate scales not bract-like; achenes not depressed at summit.

47. Perigynia pubescent.

48. Bract at base of inflorescence long-sheathing.

49. Basal sheath of inflorescence with a long leaf-like blade; scales greenish-straw-coloured, lance-acuminate or short-awned; perigynia lance-subulate, 5-6·5 mm. long; pistillate spikes very remote; leaves 2-3 mm. wide......................................83. *C. assiniboinensis*

49. Basal sheath bladeless, scales dark, pale-margined; leaves 2-2·5 mm. wide.

50. Scales exceeding the perigynia; pistillate spikes cylindric, 1-2 cm. long; staminate spike 1·5-2·5 cm. long, often stalked; bladeless sheaths strongly purple-tinged................65. *C. richardsonii*

50. Scales roundish, much shorter than the perigynia; pistillate spikes subglobose, 4-7 mm. long; staminate spike 3-6 mm. long, often sessile; bladeless sheaths green except for coloured tips ..........................................................64. *C. concinna*

48. Bract at base of inflorescence sheathless or very nearly so.

51. Achenes only obscurely 3-angled, their sides rounded or convex........................................C. Section *MONTANAE*

51. Achenes definitely 3-angled, with flat or concave sides.

52. Perigynia strongly 15-20-ribbed, their beaks nearly half as long as the body, the teeth spreading; leaves 2-8 mm. wide; plant of dry sandy habitats..............................91. *C. houghtonii*

52. Perigynia with obscure ribs mostly concealed beneath the dense pubescence, their short beaks with erect teeth; plants of damp or moist habitats.

53. Leaves flat, 2-5 mm. wide, scabrous, their margins revolute; culms sharply triangular and scabrous above......................................................92. *C. lanuginosa*

53. Leaves filiform-convolute except at base, 2 mm. wide or less, smooth and wiry; culms obtusely angled and smooth except sometimes at tip.............93. *C. lasiocarpa* var. *americana*

47. Perigynia glabrous or essentially so.

54. Style continuous with the achene and of the same bony texture, note withering; leaves more or less septate-nodulose.

55. Perigynia firm, scarcely inflated; culms 1-few from stoloniferous bases.

56. Teeth of perigynia 1 mm. long or less; perigynia lightly many-nerved; leaves glaucous, glabrous................115. *C. lacustris*

56. Teeth of perigynia 1-3 mm. long.

57. Leaves up to 12 mm. broad, pubescent beneath; middle and upper sheaths pilose; perigynia strongly ribbed, their often outwardly curving teeth 1·6-3 mm. long.........................................................117. *C. atherodes*

57. Leaves 2-8 mm. broad, they and the sheaths glabrous; perigynia less strongly nerved, their erect to barely curving teeth 1-1·8 mm. long.........................116. *C. laeviconica*

55. Perigynia thin or papery, often strongly inflated.

58. Pistillate scales with midrib excurrent as a long scabrous awn; perigynia finely and closely ribbed, several times longer than the body of the scales; plants cespitose.

59. Perigynia 3-5 mm. long, soon strongly reflexed, more or less 2-edged, not inflated, the beak shorter than the body..........................................114. *C. pseudo-cyperus*

59. Perigynia about 6 mm. long, spreading, inflated, the slender beak as long as the body...................113. *C. hystricina*

58. Pistillate scales blunt to short-awned; perigynia mostly inflated, coarsely ribbed.

60. Perigynia 10-17 mm. long; pistillate spikes subglobose, 1-3, aggregated; staminate spike solitary.......124. *C. intumescens*

60. Perigynia 10 mm. long or less; staminate spikes 1-4.....................................G. Section *VESICARIAE*

54. Style jointed to the achene, not indurated, soon disarticulating and shrivelling; perigynia 10 mm. long or less.

61. Bract at base of inflorescence sheathless or very short-sheathing.

62. Achenes only obscurely 3-angled, their sides rounded or convex.

63. Spikes all terminating erect culms; leaves 0·5-1·5 mm. wide, harsh along the long-attenuated tip; leaves and culms tufted along slender brown cord-like stolons.......................................................56. *C. supina* ssp. *spaniocarpa*

63. Spikes on culms of various lengths, some of them crowded among the leaf-bases; leaves firm and very scabrous, becoming 2·5-5 mm. wide; cespitose plant of dry sandy or rocky habitats.........................................61. *C. tonsa*

62. Achenes definitely 3-angled, with flat or concave sides.

64. Perigynium-body tightly filled to tip by the achene, 2·5 mm. long; scales purplish-black, exceeded by perigynia; staminate spike sessile, 2-6 mm. long; pistillate spikes 1-3, 2-5 mm. long, sessile or the lowest short-peduncled; leaves 1-1·5 mm. wide, recurved; low very densely cespitose plant of the Hudson Bay and northern regions..........................67. *C. glacialis*

64. Perigynium-body with summit empty (except in *C. media* and *C. norvegica*).

65. Leaves short-pilose, 1·5-3 mm. wide; perigynia strongly many-ribbed; terminal staminate spike sessile or short-peduncled; plant of dry prairie habitats..........................................................90. *C. torreyi*

65. Leaves glabrous.

66. Roots glabrous (except for rootlets); terminal spike sessile or short-peduncled, pistillate above and staminate below, or pistillate throughout (rarely entirely staminate)..........................F. Section *ATRATAE*

66. Roots closely clothed with a yellowish felt; terminal spike staminate throughout, long-peduncled........................................E. Section *LIMOSAE*

61. Bract at base of inflorescence with a prolonged tubular sheath.

67. Sheaths spathe-like, bladeless or very short-bladed.

68. Perigynia 4-4.5 mm. long, long-tapering and spongy at base; terminal spike usually pistillate at base, long-peduncled, many of the other spikes nearly or quite radical and very long-peduncled; scales purple with green centre..................................................63. *C. pedunculata*

68. Perigynia 1·5-2 mm. long; terminal spike staminate throughout, sessile or nearly so, overtopped by the 2 or more upper spikes; scales whitish or pale brown, soon dropping.....68. *C. eburnea*

67. Sheaths with well developed blades.

69. Leaves and culms pilose, the former 2·5-7·5 mm. wide; perigynia 3·5-5 mm. long, with bidentate beak about half as long as the body; scales brown, acute, thin...........82. *C. castanea*

69. Leaves and culms glabrous.......................GROUP I

## GROUP I

70. Terminal spike regularly pistillate at summit, it and the lateral ones rarely more than 3 mm. broad; scales whitish or brownish-tinged, much shorter than the perigynia.

71. Pistillate spikes 1-6 cm. long, drooping, spreading or loosely ascending; perigynia usually strongly nerved, beakless; leaves deep green, 3-9 mm. broad; culms up to 6 or more dm. high.......................................81. *C. gracillima*

71. Pistillate spikes less than 1 cm. long, erect or rarely spreading; perigynia 2-ribbed, otherwise nerveless, distinctly beaked; leaves yellowish-brown, less than 3 mm. broad; culms 1-2 dm. high.........................84a. *C. capillaris* var. *major*

70. Terminal spike regularly staminate throughout, sometimes with a few perigynia at summit.

72. Culms readily compressed, more or less wing-angled; sheaths of bracts upwardly dilated and loose; perigynia 3-4·5 mm. long, obovoid, tapering to a spongy base, strongly asymmetrical, with abruptly bent entire beak; scales whitish with green centre, somewhat shorter than the perigynia......................78. *C. blanda*

72. Culms firm, wingless, not easily compressed; sheaths of bracts close.

73. Perigynia beakless or with short essentially entire beak up to 0·5 mm. long, less than one-quarter the length of the body.

74. Staminate spike sessile or nearly so; perigynia 2·3-3 mm. long; scales pale brown, often reddish-dotted, less than half the length of the perigynia; leaves 3-12 mm. wide; plant cespitose....................79. *C. granularis*

74. Staminate spike slender-peduncled; plants loosely stoloniferous.

75. Perigynia rounded at base, suborbicular in cross-section, loosely enveloping the achenes; lowest pistillate spike often basal; scales reddish-brown, about half the length of the perigynia; leaves glaucous, often folded, 1·5-4 mm. wide.................................80. *C. crawei*

75. Perigynia tapering to base, triangular in cross-section; lowest pistillate spike non-basal.

76. Perigynia much flattened, essentially nerveless, short-ciliate-serrulate above (or glabrous in age), with bidentate beak 0·5 mm. long; achenes loosely enveloped; scales purplish-black; plant of the Hudson Bay region.................................89. *C. atrofusca*

76. Perigynia little flattened, lightly to strongly many-nerved, glabrous throughout, beakless or with minute essentially entire beak; achenes closely enveloped; scales purple or purplish-brown (sometimes pale in age)..............................D. Section *PANICEAE*

73. Perigynia with beak one-quarter to equalling the length of the body.

77. Staminate spike sessile or short-peduncled; pistillate spikes subglobose to ellipsoid.

78. Perigynia 3·2-6 mm. long, usually inflated, tapering to a beak half as long to as long as the body, the lower ones reflexed and obliquely curving; scales greenish to brown, acuminate........................88. *C. flava*

78. Perigynia 2-3 mm. long, scarcely inflated, horizontally spreading to slightly reflexed, with beak one-third the length of the body; scales brownish, obtuse....................................87. *C. viridula*

77. Staminate spike or spikes long-peduncled; pistillate spikes oblong-cylindric or narrower; perigynia ascending.

79. Plant with slender horizontal yellowish-brown stolons; pistillate spikes linear, loosely 3-20-flowered; scales brownish-purple, loose, acute.......................................................77. *C. vaginata*

79. Plants cespitose, without horizontal stolons; pistillate spikes oblong-cylindric, rather closely flowered; scales pale brown with whitish margins.

80. Pistillate spikes 1-5 cm. long, 8-10 mm. thick, their scales acute or awned; staminate spikes 1-4; perigynia globose-ovoid, with beak equalling the body; leaves 3-4 mm. wide...........86. *C. sprengelii*

80. Pistillate spikes 4-15 mm. long, 2·5-4 mm. wide, their scales acute or blunt; staminate spike usually solitary.

81. Leaves strongly channelled, 0·25-0·75 mm. wide; perigynia tapering to beak, 2-ribbed and slenderly few-nerved; staminate spike few-flowered, 2-6 mm. long; plant of the Hudson Bay and northern regions...........................85. *C. williamsii*

81. Leaves flat or slightly channelled, mostly 0·75-2·5 mm. wide; perigynia contracted into the beak, 2-ribbed, otherwise nerveless; staminate spike several-flowered, 4-8 mm. long.

82. Pistillate spikes brown, 1-3, approximate, 6-8-flowered; leaves yellowish-brown, 1·5-2·5 mm. wide, often involute; culms 5-20 cm. high.......................84. *C. capillaris*

82. Pistillate spikes pale, 3-4, up to 20-flowered; leaves green, flat, 1·5-4 cm. broad; culms 15-60 cm. high....................................................84b. *C. capillaris* var. *elongata*

## A. Section Heleonastes

1. Staminate flowers terminal in the spikes; perigynia nearly round in cross-section, 2-2·8 mm. long, finely many-nerved, rounded at summit to a minute entire beak.......................................................18. *C. disperma*

1. Staminate flowers basal or scattered; perigynia flattened on one face.

2. Bract at base of inflorescence bristle-form and much prolonged, many times the length of the subtended spike; inflorescence flexuous; spikes all widely separate; perigynia 3·3-4 mm. long; leaves 1-2 mm. broad...................19. *C. trisperma*

2. Bract at base of inflorescence shorter or none (only in *C. arcta*, with leaves 2·5-4 mm. broad, occasionally prolonged); inflorescence straightish; at least the upper spikes approximate.
   3. Perigynia beakless or nearly so; scales white; leaves 0·5-2 mm. wide.
      4. Spikes crowded in a silvery, suborbicular to ovoid head; scales about as long as the perigynia, the latter obscurely nerved....................20. *C. tenuiflora*
      4. Spikes remote; scales about half the length of the perigynia, the latter conspicuously many-ribbed; plant of the far-northern region...........21. *C. loliacea*
   3. Perigynia short-beaked to strongly beaked; scales whitish to brown.
      5. Perigynia broadest near base, ovate, rounded to subcordate at base, 2-3 mm. long, strongly nerved dorsally, more obscurely nerved ventrally; leaves 2·5-4 mm. broad; culms very soft........................................27. *C. arcta*
      5. Perigynia broadest near the middle, gradually tapering to base; leaves mostly narrower.
         6. Spikes 2-4, approximate; scales brown; plants of the Hudson Bay region.
            7. Perigynia abruptly short-beaked...........22. *C. bipartita* var. *amphigena*.
            7. Perigynia tapering uniformly to apex, the broad-based beak scarcely differentiated from the body..............................23. *C. amblyoryncha*
         6. Spikes 3-11, scattered.
            8. Terminal spike with prolonged staminate base; perigynia closely covered by the obtuse orange-brown scales; plant of the Hudson Bay region.......... ................................................24. *C. mackenziei*
            8. Terminal spike not greatly prolonged at base; scales whitish to brownish-tinged, shorter than the perigynia.
               9. Perigynia 5-10 in each spike, loosely spreading at maturity, serrulate at base of the distinct beak; leaves 1-2·5 mm. broad; plant green............ ................................................25. *C. brunnescens*
               9. Perigynia 10-30 in each spike, appressed, smooth or at most sparsely serrulate at base of the inconspicuous beak; leaves 2-4 mm. broad; plants glaucous.
                  10. Spikes 6-12 mm. long; perigynia 2·3-3 mm. long, often serrulate near summit........................................26. *C. canescens*
                  10. Spikes 4-7 mm. long; perigynia rarely more than 2 mm. long, often quite smooth.........................*C. canescens* var. *subloliacea*

## B. Section OVALES

1. Bracts leaf-like and many times exceeding the dense head, the lowest 1-2 dm. long; leaves 2-4 mm. broad; perigynia lance-subulate, about 5 mm. long and 1 mm. broad...... ......................................................50. *C. sychnocephala*
1. Bracts (when present) neither leaf-like nor prolonged.
   2. Scales about equalling the perigynia and nearly or completely covering them.
      3. Heads dense and erect, of crowded or approximate spikes; inner face of perigynia nerveless or nerved only at base.
         4. Perigynia thin and scale-like, 4-4·8 mm. long, 2-2·5 mm. broad, closely appressed; bracts not prominent; leaves 1-3 mm. wide; culms harsh above....46. *C. xerantica*
         4. Perigynia plump, 4-5 mm. long, 2-3 mm. broad, loosely ascending in age; lower 1-2 bracts often prominent; leaves 2-5 mm. wide; culms smooth................ ......................................................47. *C. adusta*
      3. Heads interrupted and flexuous, at least the lower spikes remote.
         5. Perigynia 3-4·5 mm. long, usually strongly nerved on inner face; spikes pale, leaves 2-4·5 mm. wide..................................49. *C. argyrantha*
         5. Perigynia nerveless or only short-nerved on inner face; spikes brown.
            6. Perigynia 4·5-6·5 mm. long, 1·5-2 mm. broad, their beaks roundish in cross-section, not serrulate toward tip; leaves 1-3·5 mm. wide........32. *C. praticola*
            6. Perigynia 4-5 mm. long, 1·9-2·7 mm. broad, their beaks flattened and serrulate to tip; leaves 2-4 mm. broad................................48. *C. aenea*

2. Scales shorter than the perigynia and noticeably narrower above.

7. Spikes 1·5-2·5 cm. long, long-cylindric, pointed; perigynia scale-like, 7-10 mm. long, about 2·5 mm. broad, about twice as long as the brownish scales; leaves 3-7 mm. wide........45. *C. muskingumensis*

7. Spikes 3-15 mm. long (if longer, with shorter and broader perigynia); perigynia 2-7·7 mm. long.

8. Perigynia at most 2 mm. broad.

9. Beak of perigynium slender and roundish in cross-section, little if at all serrulate at the scarcely margined tip; perigynia thin, 3·75-5 mm. long, 1·5-2 mm. broad; scales dark brown; head dense; leaves 2-6 mm. wide....31. *C. festivella*

9. Beak of perigynium flattened and margined to the serrulate tip.

10. Perigynia thin and scale-like except where distended by the achene, nerved on both faces.

11. Sheaths close; leaves 1-3 mm. wide; perigynia 4-7 mm. long; spikes lustrous........34. *C. scoparia*

11. Sheaths loose, the inner band weak and friable; leaves 3-7 mm. wide; perigynia 3·25-5 mm. long; spikes opaque........43. *C. projecta*

10. Perigynia thicker and firm.

12. Tips of mature perigynia spreading and concealing the scales; wing of perigynium abruptly contracted below the middle; spikes globose or subglobose; leaves 3-7 mm. broad, with loose sheaths..44. *C. cristatella*

12. Tips of mature perigynia ascending, not concealing the scales, wing of perigynium continuous; spikes ovoid or obovoid; leaves with tight sheaths (except *C. normalis*).

13. Perigynia narrowly lanceolate, 3-4 mm. long, 0·4-1 mm. broad, acute to subacute at base; leaves 1-4 mm. wide, yellowish-green........33. *C. crawfordii*

13. Perigynia 1-2 mm. broad, broadly cuneate or rounded at base.

14. Heads compact, 1-4 cm. long.

15. Perigynia nerveless or only faintly nerved at base on inner face, 2-4 mm. long, 1-2 mm. broad; scales brown; heads 1-2·5 cm. long; leaves 1·5-4·5 mm. wide, their sheaths tight........35. *C. bebbii*

15. Perigynia distinctly nerved on inner face, 3-4 mm. long, 1·5-2 mm. broad; scales pale green; heads 1·5-4 cm. long; leaves 3·5-6·5 mm. broad, their sheaths loose........37. *C. normalis*

14. Heads interrupted; perigynia 3-4 mm. long.

16. Leaves 3·5-6·5 cm. wide, their sheaths loose; perigynia about 7-nerved on inner face; heads 1·5-4 cm. long, straight........37. *C. normalis*

16. Leaves 0·5-2·5 mm. wide, their sheaths tight; perigynia nerveless or only faintly nerved on inner face; heads 2·5-5 cm. long, flexuous or nodding........36. *C. tenera*

8. Perigynia more than 2 mm. broad (or sometimes only 2 mm. broad in *C. molesta*).

17. Perigynia thin and scale-like, 4-7 mm. long, 1·2-2·6 mm. broad, nerved on both faces; leaves 1-3 mm. wide, their sheaths close........34. *C. scoparia*

17. Perigynia thicker and firmer (if scale-like in *C. bicknellii*, 2·7-4·8 mm. broad).

18. Perigynia broadly obovate, widest above the middle, 3-4 mm. long, 2-3·4 mm. broad, nerveless on inner face, the short deltoid beak gradually tapering to body; leaves 3-6 mm. wide, their sheaths loose........42. *C. cumulata*

18. Perigynia ovate to suborbicular, widest below the middle, the beak elongate and more distinctly differentiated from body; sheaths close.

19. Perigynia thin and translucent, 5·5-7·7 mm. long, 2·7-4·8 mm. broad, about 10-nerved (strongly) on each face; leaves 2-4·5 mm. wide........41. *C. bicknellii*

19. Perigynia thick and firm, 4-5·5 mm. long.

20. Scales acuminate, nearly equalling beak of perigynium, the latter nerveless or faintly nerved on inner face; head 2-4·5 cm. long, its spikes often prolonged at base; leaves 1-4 mm. wide..........................................................39. *C. brevior*
20. Scales blunter, reaching only to base of beak; lateral spikes without prolonged bases.
    21. Head compact, 1-3 cm. long; perigynia 2-3 mm. broad, pale green, nerveless to strongly few-nerved on inner face; leaves mostly 2-3·5 mm. wide......................38. *C. molesta*
    21. Head usually interrupted, (2-)3-7·5 cm. long; perigynia 2·5-3·5 mm. broad, pale brown, nerveless to faintly few-nerved on inner face; leaves 3-4·5 mm. wide.................................................40. *C. merritt-fernaldii*

## C. Section MONTANAE

1. Perigynia glabrous or very sparsely short-pubescent above; scales mostly long-tapering, about equalling to much longer than perigynia; some of the spikes crowded among the bases of the very hard scabrous leaves..................................61. *C. tonsa*
1. Perigynia distinctly pubescent.
    2. Culms all elongate.
        3. Body of perigynium subglobose, somewhat loose over the achene; scales nearly equalling to exceeding perigynia; terminal staminate spike 0·8-2 cm. long; culms usually with persistent brush-like tufts of fibres at base..................................................................58. *C. pensylvanica* var. *digyna*
        3. Body of perigynium ellipsoid to fusiform-obovoid, definitely longer than thick, tightly investing achene.
            4. Perigynia 3-4 mm. long, copiously short-hirsute, gradually narrowed to a thick spongy base; scales with broad white margins; culms ascending, much exceeding the leaves; plant pale green....................................57. *C. peckii*
            4. Perigynia 2·5-3 mm. long, minutely pubescent, gradually narrowed to a long slender stipe; scales with purple margins; culms flexuous, mostly shorter than the leaves; plant deep green....................................59. *C. deflexa*
    2. Culms of various lengths, the shorter ones crowded among the leaf-bases, their spikes often all pistillate; scales shorter than perigynia.
        5. Perigynia 3-4·5 mm. long, their beaks 0·7-1·5 mm. long; staminate spike 3-15 mm. long; bract at base of inflorescence 0·5-5 cm. long; leaves firm; culms stiffly ascending, harsh above..............................................60. *C. rossii*
        5. Perigynia 2·5-3 mm. long, their beaks about 0·5 mm. long; staminate spike 2-5 mm. long; basal bract 5-10 mm. long; leaves soft; culms flexuous, smooth except at tip ..........................................................59. *C. deflexa*

## D. Section PANICEAE

1. Perigynia with a straight bidentate beak about 1 mm. long; pistillate spikes loosely flowered...........................................................77. *C. vaginata*
1. Perigynia beakless or with a very short oblique entire tip; pistillate spikes more closely flowered.
    2. Leaves white-glaucous, 0·5-3·5 mm. wide, soon infolded lengthwise; perigynia white-glaucous, tapering to an acute or slenderly conical tip........73. *C. livida* var. *grayana*
    2. Leaves green or only slightly glaucous, flat or in age with revolute margins.
        3. Lower sheaths largely bladeless; leaves green, 1·5-4 mm. wide; perigynia not turgid..........................................................76. *C. woodii*
        3. Lower sheaths mostly blade-bearing.
            4. Leaves greyish and stiffish, 2·5-7 mm. wide; pistillate spikes 5-7 mm. wide; perigynia somewhat turgid in age..............................75. *C. meadii*
            4. Leaves green, softer, 1·5-4·5 mm. wide; pistillate spikes 3·5-5 mm. wide; perigynia not turgid.............................................74. *C. tetanica*

## E. Section Limosae

1. Plants strongly stoloniferous; pistillate scales obtuse to acute, not long-acuminate.

2. Culms obtusely angled; leaves green, flat; pistillate scales purple-brown to blackish, soon deciduous; plant of the Hudson Bay and northern regions.........94. *C. rariflora*

2. Culms sharply angled; leaves glaucous, involute or corrugated; pistillate scales often paler, persistent.........95. *C. limosa*

1. Plants cespitose; pistillate scales long-acuminate.

3. Culms smooth or nearly so below inflorescence.........96. *C. paupercula*

3. Culms scabrous on the angles, at least above.........96a. *C. paupercula* var. *pallens*

## F. Section Atratae

1. Culms lateral, terminating elongate rhizomes, not clothed at base with dried-up leaves of the previous year; spikes sessile or the lowest short-peduncled; plants of wet, marshy habitats.

2. Spikes rather crowded, the terminal one staminate or androgynous; pistillate scales purplish-black, awnless; plant of the far-northern region.........102. *C. morrisseyi*

2. Spikes less crowded, the lowest internode of the rachis up to 6 cm. long; terminal spike regularly gynaecandrous; pistillate scales brown to purplish-black, mostly long-awned.........103. *C. buxbaumii*

1. Culms arising from the midst of the remains of leaves of the previous year; pistillate scales awnless; plants of drier habitats.

3. Plants of the Hudson Bay and low-northern regions, short-stoloniferous.

4. Lateral spikes slender-peduncled; scales usually shorter than the perigynia, occasionally longer; terminal spike staminate at base (rarely pistillate throughout) .........101. *C. raymondii*

4. Lateral and terminal spikes crowded into a dense head, sessile or nearly so; scales much shorter than perigynia; terminal spike mostly pistillate throughout.

5. Perigynia 2-2·5 mm. long, abruptly short-beaked, becoming reddish or purple, strongly granular; culms stiff, 0·5-3 dm. high; plant of open habitats.........100. *C. norvegica*

5. Perigynia 2·5-3·5 mm. long, tapering to beak, whitish to pale brown, sparingly granular; culms weak, up to 6 dm. high; plant of northern woodlands.........99. *C. media*

3. Plants of the southern region, long-stoloniferous; lower spikes short-peduncled; scales about equalling the perigynia.

6. Achenes sessile; beak of perigynia 0·3 mm. long; spikes 1-5, often all pistillate or the terminal one staminate; leaves 2-4 mm. wide.........97. *C. hallii*

6. Achenes short-stipitate; beak of perigynia 0·1-0·2 mm. long; spikes 3-5, the terminal one pistillate at summit, staminate below (sometimes nearly staminate); leaves 2-3 mm. wide.........98. *C. parryana*

## G. Section Vesicariae

1. Stigmas normally 2; achenes lenticular; beaks of perigynia entire or nearly so; scales blunt, purplish-black; plants of the Hudson Bay and northern regions.

2. Staminate spike 1-2 mm. wide; anthers 1·5-2·5 mm. long; perigynia 2·5-3·5 mm. long, tightly investing the achene except above; leaves mostly less than 3 mm. wide.........118. *C. saxatilis* var. *miliaris*

2. Staminate spike 2-4 mm. wide; anthers up to 3 mm. long; perigynia 3·2-5 mm. long, more or less inflated; leaves 1·5-5 mm. wide.........*C. saxatilis* var. *major*

1. Stigmas 3; achenes triangular in cross-section; beaks of perigynia sharply bidentate.

3. Perigynia soon reflexed or horizontally spreading, much exceeding the acuminate scales; staminate spikes 1-4; lower bracts greatly prolonged, many times the length of the inflorescence; leaf-sheaths loose, with brown inner band.........122. *C. retrorsa*

3. Perigynia ascending to merely spreading; bracts not more than a few times longer than the inflorescence; leaf-sheaths close.

4. Culms mostly thick and spongy at base, smooth and obtusely angled (except at very summit), strongly stoloniferous; leaves prominently septate-nodulose when dry.
    5. Pistillate spikes 1·5-7 cm. long, their scales blunt or merely acute, shorter than the perigynia, the latter 3-6 mm. long; leaves 2-8 mm. broad.......121. *C. rostrata*
    5. Pistillate spikes 2-15 cm. long, their scales acuminate to short-awned, about equalling the perigynia, the latter 4-10 mm. long; leaves 1-12 mm. broad............................................................*C. rostrata* var. *utriculata*
4. Culms slender, rarely spongy at base, more acutely angled and often harsh above.
    6. Leaves strongly involute, 1-3 mm. wide, wiry; staminate spike mostly solitary; pistillate spikes sessile or nearly so, suborbicular to oblong, 8-25 mm. long; plants long-stoloniferous.
        7. Pistillate scales purplish-black; perigynia 3-3·5 mm. long, straw-coloured, usually brownish-tinged, obscurely few-nerved; plant of the Hudson Bay and northern regions....................................120. *C. rotundata*
        7. Pistillate scales chestnut-brown; perigynia 4-7 mm. long, yellowish-green, strongly several-nerved................................123. *C. oligosperma*
    6. Leaves flat, flexible, 2-7 mm. wide; staminate spikes 2-4; pistillate spikes 1-7·5 cm. long, sessile or short-peduncled, their yellowish-brown to purplish-brown scales acute to acuminate; perigynia 3-9 mm. long; plant densely cespitose ........................................................119. *C. vesicaria*

1. **C. capitata** L.

Known from the following Manitoba localities: Churchill (several collections, the first by Macoun in 1910); Baralzon Lake, lat. 60° N., rocky tundra (Scoggan & Baldwin, 1950); Nejanilini Lake, lat. 59° 22′ N., sand-gravel ridge (Scoggan & Baldwin, 1950); Cochrane River, lat. 58° 31′ N., granite outcrop (Baldwin, 1951); Nueltin Lake, lat. 59° 48′ N., barren island (Baldwin, 1951). First report: Churchill [Radforth, 1950].

(Arctic-)subarctic circumpolar: n. Alaska to Great Bear L., s. Keewatin, s. Baffin I., n. Lab., and n. Nfld., s. in the mts. to Calif., Mexico, and N.H.; Greenland; Iceland; n. Eurasia. A map of the distribution is given by Raymond [1950, fig. 15].

Forma *arctogena* (Sm.) Raymond, differing chiefly in its lower growth and darker-coloured spike, appears to be represented in some of the above collections.

2. **C. maritima** Gunn. (*C. incurva* Lightf.)

Known from the following Manitoba localities: Churchill (several collections, the first by Macoun in 1910); York Factory (McTavish, 1854; Scoggan, dry barrens, 1949). First report: Churchill [Størmer, 1933].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Lab., and n. Nfld., s. to s. Yukon, James Bay, and e. Que.; Greenland; Iceland; Spitsbergen; n. Eurasia.

3. **C. dutillyi** O'Neill & Duman

Known only from the type locality, Churchill, where it was discovered by Duman and Dutilly in 1938. First report: Churchill and vicinity [O'Neill & Duman, Rhodora 43: 416. 1941].

Known only from the above locality.

4. **C. douglasii** Boott

Specimens appearing referable here have been seen from Ste. Rose, southeast of Dauphin Lake, and Chatfield, about 60 miles north of Winnipeg. A so-named specimen from Bowsman, southeast of Porcupine Mountain, is too immature for precise determination. First report: Red River, open prairie [Dawson, 1875]. In view of Dawson's statement that "This is the first Carex to appear in flower, and occurs very abundantly all over the prairie of the Red River", it is strange that it has not been more often collected.

Temperate western American: B.C. to Man., s. to Calif. and N.M.

5. **C. stenophylla** Wahl. var. **enervis** (Mey.) Kükenth. (*C. eleocharis* Bailey)

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Ethelbert, east of Duck Mountain (Jackson, 1922). Earliest collection seen: Fort Garry (Macoun, 1872). First report: "Manitoba" [Mackenzie, 1931]; basis of earlier reports of the main form.

Subarctic western American: s. Alaska and s. Yukon to n. Alta. and s. Man., s. to Oreg., N.M., Kans., and Ia.; the main form is a native of Eurasia.

6. **C. praegracilis** Boott (*C. marcida* Boott)

Moist ground and prairie of southern Manitoba. Northernmost collection: Riding Mountain (presumably in the natural prairie opening) (Rowe, 1948). Earliest collection seen: Fort Garry, "throughout the prairie region" (Macoun, 1872). First report: Winnipeg [Bourgeau, in Palliser, 1863].

Subarctic western American: central Yukon to n. B.C., s. Man., and Ia., s. to Mexico.

7. **C. sartwellii** Dew.

Marshy ground and shores of southern Manitoba. Northernmost collection: Ochre River, south of Dauphin Lake (Jackson, 1920). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Winnipeg [Macoun, 1888; in synonymy with *C. disticha* Huds., which, however, is a distinct species].

(Subarctic-)temperate American: n. B.C. and s. Mack. to s. Man., James Bay, and sw. Que., s. to Colo., Ill., and N.Y. Part of the area is shown on a map by Raup [1930, map 32], on which the occurrence of the species in Manitoba should be indicated.

8. **C. siccata** Dew.

Sandy prairie and dry soil almost throughout the province except the extreme north. Northernmost collection: Cochrane River, lat. 58° 13′ N., grassy point (Baldwin, 1951). Earliest collection seen: Emerson, south of Winnipeg near the International boundary (Burgess, 1873). First report: Lake Winnipeg [Hooker, 1839].

(Subarctic-)temperate American: s. Yukon and s. Mack. to n. Man., the Great Lakes region, and Me., s. to Ariz., N.M., Neb., O., and N.J.

According to Svenson [Rhodora 40: 325-329. 1938], this plant should now be called *C. foenea* Willd., and the plant formerly passing under this latter name should now be known as *C. argyrantha* Tuckerm. Gleason [1952], however, retains *C. siccata*, and the same policy is followed here in view of the almost exclusive use of this name in reports prior to 1938.

### 9. **C. chordorrhiza** L. f.

Sphagnum bogs, lake borders, and tundra throughout the province. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: Lake Winnipeg and Norway House [Hooker, 1839].

Arctic circumpolar: n. coast of Alaska and Mack., Victoria I., s. Baffin I., n. Lab., and Nfld., s. to B.C., Man., Ia., and Vt.; Iceland; n. Eurasia.

### 10. **C. rosea** Schk.

Swampy ground and low woodlands of southern Manitoba. Northernmost collection: Seven Sisters Falls, about 65 miles northeast of Winnipeg, rich elm woods (Scoggan, 1951). Earliest collection seen: Emerson, south of Winnipeg (Burgess, 1873). First report: Red River, swamp [Dawson, 1875].

Temperate eastern American: Man. to e. Que., s. to La. and Ga.

### 11. **C. convoluta** Mack.

Specimens have been seen from only the following localities: Winnipeg, damp woods (Macoun, 1896); Portage la Prairie (Macoun & Herriot, 1906). Both specimens were determined by Mackenzie. First report: "Manitoba" [Mackenzie, 1931].

Temperate eastern American: Man. to N.B., s. to e. Kans., Ark., Ala., and S.C. This species is included by Gleason [1952] in his treatment of the foregoing one.

*C. cephalophora* Muhl. is included by Lowe [1943] in his checklist, but he notes the absence of supporting specimens. Manitoba is included in the ranges given by Mackenzie [1931] and Fernald [1950], but no specimens have been located, and the species must be excluded from our flora for the present.

### 12. **C. hookerana** Dew.

Specimens have been seen from only the following localities: Macgregor, about 50 miles east of Brandon (Macoun & Herriot, 1906; specimen determined by K. Mackenzie); Brandon (Malte, 1918). The species is a plant of dry prairie habitats. First report: "Manitoba" [Mackenzie, 1931].

Temperate western American: Alta. to w. Ont., s. to N.D.

### 13. **C. vulpinoidea** Michx.

Swampy ground and shores in the southern half of the province. Northernmost collection: Playgreen Lake, north of Lake Winnipeg, sandy shore (Scoggan, 1948). Earliest collection seen: Black River, near the southeast end of Lake Winnipeg (Macoun, 1884). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

(Subarctic-)temperate American: s. B.C. and central Alta. to central Man. and Nfld., s. throughout most of the United States.

14. **C. diandra** Schrank (*C. teretiuscula* Good.)

Bogs and swamps throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Polunin in 1936). Earliest collection seen: Carberry, east of Brandon (Macoun & Herriot, 1906). First report: York Factory [Bell, 1881].

Subarctic circumpolar: s. Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, and Nfld., s. to Calif., Neb., and Pa.; Iceland; Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XVII].

15. **C. prairea** Dew.

Specimens have been seen from the following localities: Assiniboine Rapids, near Brandon (Macoun, 1879); Brandon, marsh (Macoun, 1896); Riverton, west coast of Lake Winnipeg opposite Hecla Island, black spruce muskeg (Scoggan, 1951). The first two specimens were determined by K. Mackenzie. First report: "Very common in marshes throughout Manitoba..." [Macoun, 1888; as *C. teretiuscula* var. *ramosa*]. "*C. paradoxa*", cited by Hooker [1839] from Norway House, may be referable here, although it is more likely that some other species is involved.

Temperate American: Alta. to Que., s. to Neb. and Pa.

16. **C. stipata** Muhl.

Swampy ground and shores of southern Manitoba. Northernmost collection seen: Swan Lake House, formerly on Swan Lake north of Duck Mountain, wet meadows (Macoun, 1881). Earliest collection seen: the foregoing Swan Lake specimen. First report: Muskeg Creek, Lake Winnipeg and "Marshy places along Lake Winnipegoosis, and at Swan Lake House, Man." [Macoun, 1888].

(Subarctic-)temperate American: s. Alaska and n. B.C. to James Bay, s. Lab., and Nfld., s. to Calif. and Fla.; e. Asia.

17. **C. alopecoidea** Tuckerm.

Specimens have been seen from the following localities: Turtle Mountain, thicket (Burgess, 1873); Camp Morton, about 50 miles north of Winnipeg, shore of Lake Winnipeg (A. & D. Löve, 1952); Pelican Lake, northeast of Turtle Mountain (A. &. D. Löve, 1953); Melita, 60 miles southwest of Brandon, dry prairie (Scoggan, 1953); Coulter, 70 miles southwest of Brandon, dry prairie slope (Scoggan, 1953). First report: Turtle Mountain, low open prairie [Dawson, 1875].

Temperate eastern American: Man. to s. Que., s. to Ia. and N.E.

18. **C. disperma** Dew. (*C. tenella* Schk.)

Damp woods and open ground throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet black spruce woods (Baldwin, 1951). Earliest collection seen: Lake of the Woods, Man., low thick woods (Dawson, 1873). First report: York Factory [Macoun, 1888].

Subarctic circumpolar: north-central Alaska and nw. Mack. to s. Keewatin, James Bay, n. Que., and Nfld., s. to Calif., N.M., S.D., and Pa.; Eurasia.

19. **C. trisperma** Dew.

Damp woods and open ground of southern Manitoba. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, open ground (Scoggan, 1949). Earliest collection seen: Swan Lake, east of Porcupine Mountain, cedar swamps and rich low woods (Macoun, 1881). First report: "Manitoba" [Mackenzie, 1931].

(Arctic-)subarctic American: central Alta. to n. Lab. and Nfld., s. to Minn., Ill., Tenn., and N.C.

20. **C. tenuiflora** Wahl.

Boggy ground and moist woodlands throughout the province. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Swan Lake, east of Porcupine Mountain, swamp (Macoun, 1881). First report: "Canada to Norway House" [Hooker, 1839].

(Arctic-)subarctic circumpolar: n. Alaska and n. Mack. to s. Keewatin, n. Lab., and Nfld., s. to s. Alta., Minn., and N.Y.; Eurasia. A map of the northern part of the American area is given by Raup [1930, map 35].

21. **C. loliacea** L.

Known in Manitoba only from Nueltin Lake, lat. 59° 43′ N., where it was collected in a wet black spruce woods by Baldwin in 1951. First report: Nueltin Lake [Baldwin, 1953].

Subarctic ?circumpolar: central Alaska to n. Man., s. to sw. Alaska and nw. Sask.; n. Eurasia. A map of the American distribution west of Manitoba is given by Raup [1947, pl. XVII].

22. **C. bipartita** Bellardi var. **amphigena** (Fern.) Polunin. (*C. glareosa* Wahl. var. *amphigena* Fern.; *C. marina* of auth., not Dewey.)

Known in Manitoba only from Churchill, where it was first collected by Porsild in 1930. It is a species of coastal salt marshes. First report: the present publication; the citation of the main form from Churchill by Lowe [1943] is referable here.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to about lat. 80° N.), n. Lab., and Nfld., s. to s. Alaska, n. Man., James Bay, and e. Que.; Greenland; Iceland; n. Eurasia. This entity is now conceded to have a much more northerly extension than indicated on the map of Potter [1932, map 9]. The map of the main form given by Raup [1947, pl. XVII] is more applicable.

23. **C. amblyorhyncha** Krecz.

Known in Manitoba only from Churchill, where it was first collected by Duman in 1938. The Duman collections were distributed under the name of *C. neurochlaena* Holm, but, as pointed out by Böcher [Acta Arctica 5: 21. 1952], are almost certainly referable to the present species, and have been so determined by Porsild. First report: the foregoing Churchill citation by Böcher.

Arctic ?circumpolar (including ssp. *pseudolagopina* (Sørensen) Böcher): n. coast of Alaska and Mack., Victoria I., Baffin I., and n. Que. (Hudson Str.), s. to Great Bear L., n. Man., and James Bay; Greenland; Spitsbergen; n. Asia. A map of the distribution is given in Böcher's 1952 paper (p. 27), large gaps in the circumpolar area being denoted as filled by the closely related *C. heleonastes* Ehrh.

*C. neurochlaena* Holm, cited from Churchill by Duman [Bull. Torrey Bot. Club 74: 152. 1947], is noted above as referable to the foregoing species.

*C. heleonastes* Ehrh., reported by Hooker [1839] from Norway House, by Fernald [Contr. Gray Herb. No. 22: 495. 1902] from York Factory, and by Ritchie [1956a] from MacBride Lake, may be referable to *C. amblyorhyncha*, or, according to Böcher's map, may be a distinct entity in our flora. Its final disposition must await further collecting.

24. **C. mackenziei** Krecz. (*C. norvegica* Willd., not Retz.)

Specimens have been seen only from Churchill, where this species was first collected by Polunin in 1936. It is a plant of coastal salt marshes. First report: Potter [1932; map 1, showing a station for the species evidently at Port Nelson, near York Factory].

Subarctic circumpolar: nw. coast of Alaska, Mack. R. Delta, se. Keewatin, north-central Lab., and Nfld., s. to southernmost Alaska, James Bay, and Me.; s. Greenland; Eurasia.

25. **C. brunnescens** (Pers.) Poir.

Dry or moist woodlands and clearings throughout the province except the southwestern prairie region and the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., open bog (Baldwin, 1951). Earliest collection seen: Swan Lake, east of Porcupine Mountain, swamps (Macoun, 1881). First report: Warren Landing [Lowe, 1920]. Some of the Manitoba specimens appear referable to the intergrading and scarcely distinct var. *sphaerostachya* (Tuckerm.) Kük.

(Arctic-)subarctic circumpolar: n. Alaska, Mack. R. Delta, and Great Bear L. to n. Man., n. Lab., and Nfld., s. to Oreg., Utah, Colo., Tenn., and N.C.; Greenland; Iceland; Eurasia.

26. **C. canescens** L.

Swamps and bogs throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Gillam, about 165 miles south of Churchill (Simpson, 1942). First report: Lake Winnipeg [Hooker, 1839]. Some of the material is referable to the intergrading and barely distinct var. *subloliacea* Laestad.

(Arctic-)subarctic circumpolar: n. Alaska, Mack. R. Delta, and Great Bear L. to s. Keewatin, n. Lab., and Nfld., s. to Calif., Ariz., the Great Lakes region, and W. Va.; Greenland; Iceland; Eurasia. A map of the northern part of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XVII].

*C. gracilis* Curt., reported by Gröntved [1936] from Churchill, is probably referable to this or the preceding species.

27. **C. arcta** Boott

The following is the only specimen seen: Sasaginnigak Lake, about 125 miles northeast of Winnipeg, damp thicket (Breitung, 1949). First report: the listing of *C. "areta"* by Burman [1910] probably refers to this species.

(Arctic-)subarctic American: s. Yukon and n. Alta. to n. Que., s. to n. Calif., Ida., Mont., the Great Lakes region, and N.Y. A map of the northern part of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1930, map 34].

28. **C. gynocrates** Wormskj. (*C. alascana* Böck.)

Sphagnum bogs and muskeg forest almost throughout the province. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: York Factory (McTavish, probably 1853 or 1854) (the earliest dated specimens seen are those collected by Macoun in 1881 from Red Deer Lake and River, and Porcupine Mountain). First report: Churchill River [Bell, 1880]; basis of the report of *C. dioica* by Rae [1850] from between York Factory and Churchill.

(Arctic-)subarctic circumpolar: n. Alaska, Mack. R. Delta, and Great Bear L. to s. Baffin I., n. Lab., and Nfld., s. to B.C., Colo., the Great Lakes region, and Pa.; Greenland; n. Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XVII].

29. **C. interior** Bailey (*C. scirpoides* Schk.)

Damp or wet habitats in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground (Scoggan, 1948). Earliest collection seen: Assiniboine Rapids, near Brandon, boggy places (Macoun, 1879). First report: "Manitoba" [Mackenzie, 1931]; probable basis of the listing of *C. echinata* var. *microstachys* (*C. angustior* Mack.) by Burman [1910].

(Subarctic-)temperate American: n. B.C. to s. Hudson Bay and Nfld., s. to n. Calif., n. Mex., Kans., and Pa.

*C. sterilis* Willd. appears represented from the province by specimens collected by Denike at Victoria Beach in 1942 and Birds Hill, near Winnipeg, in 1943. It differs so little from the foregoing species, however, that further collections should be made before it is admitted as a distinct entity of our flora.

30. **C. deweyana** Schwein.

Rich open woods, shores, and clearings throughout the southern half of the province. Northernmost collection: Knee Lake, about 160 miles southwest of York Factory, clearing (Scoggan, 1949). Earliest collection seen: Punk Island, off Grindstone Point, Washow Bay, Lake Winnipeg (Macoun, 1884). First report: Norway House [Hooker, 1839].

(Subarctic-)temperate American: n. Alta. to James Bay and e. Que., s. to Ida., Colo., S.D., and Pa.

31. **C. festivella** Mack.

Specimens have been seen from only the following localities: confluence of the Assiniboine and Qu'Appelle rivers, about 75 miles northwest of Brandon (Macoun & Herriot, 1906); Riding Mountain, edge of Edward Creek (Scoggan, 1953). First report: "Manitoba" [Mackenzie, 1931]; basis of the listing by Burman [1910] of the doubtfully distinct *C. festiva*.

(Subarctic-)temperate western American: ne. B.C. to Man., s. to Calif., N.M., and S.D.

32. **C. praticola** Rydb. (*C. pratensis* Drejer)

Open woods, prairie, rock outcrops, and clearings throughout the southern half of the province. Northernmost collection: Oxford Lake, about 120 miles northeast of Norway House, clearing (Scoggan, 1949). Earliest collection seen: Manitoba House, Lake Manitoba, about 70 miles northwest of Portage la Prairie, dry gravelly soil (Macoun, 1881; distributed as *C. liddoni*, but revised by Mackenzie). First report: Macoun [1888].

Subarctic American: central Alaska to central Man., James Bay, and Nfld., s. to Calif., Colo., N.D., and N.E.; s. Greenland.

33. **C. crawfordii** Fern.

Dry to wet open habitats throughout the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). Earliest collection seen: Winnipeg, wet meadows (Macoun, 1872). First report: Lake Winnipeg [Fernald, Contrib. Gray Herb. No. 22: 470. 1902].

Subarctic American: central Alaska to n. Alta., the Great Lakes region, s. Lab., and Nfld., s. to Wash., Ida., Mich., and Tenn.

34. **C. scoparia** Schk.

Dry to wet open ground and woodlands of southern Manitoba. Northernmost collection seen: Sasaginnigak Lake, about 125 miles northeast of Winnipeg, rocky shore (Breitung, 1949); but reported by Bell [1880] from "Nelson River between Lake Winnipeg and the coast of Hudson's Bay". Earliest collection seen: Winnipeg, wet meadows (Macoun, 1872). First report: Bell [1880].

(Subarctic-)temperate American: B.C. to Nfld., s. to Oreg., N.M., and S.C.

35. **C. bebbii** Olney

Dry to wet open ground throughout the southern two-thirds of the province. Northernmost collection: Hayes River between Swampy Lake and Brassey Hill, about 120 miles southwest of York Factory, rocky shore (Scoggan, 1949). Earliest collection seen: Washow Bay, Lake Winnipeg (Macoun, 1884). First report: Warren Landing [Lowe, 1920].

(Subarctic-)temperate American: e. Alaska to Nfld., s. to Wash., Colo., Neb., and N.Y.

36. **C. tenera** Dew. (Incl. var. *echinodes* (Fern.) Wieg.)

Dry to moist open ground and woodlands throughout the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, rocky island (Scoggan, 1948). Earliest collection seen: "Manitoba" (Macoun, 1872). First report: Macoun [1888; as *C. straminea* var. *tenera*]. Reports of *C. straminea* from the province [Hooker, 1839; Bourgeau, in Palliser, 1863; Dawson, 1875; Macoun, 1888; Burman, 1910] are probably referable here.

Temperate American: Alta. to e. Que., s. to Mont., S.D., Mo., O., and N.C.

37. **C. normalis** Mack. (*C. mirabilis* Dew.)

Specimens have been seen from the following localities: Caddy Lake, near the Ontario boundary east of Winnipeg (D. Löve, 1954); Brandon (Macoun, 1896); Manitoba House, Lake Manitoba, about 70 miles northwest of Portage la Prairie (Macoun, 1881); Macgregor, east of Brandon (Macoun & Herriot, 1906); Norway House, off the northeast end of Lake Winnipeg (Bisby, 1923). First report: Manitoba included in range given by Fernald [Contrib. Gray Herb. No. 22: 473. 1902].

Temperate eastern American: Man. to Me., s. to Okla., Tenn., and N.C.

38. **C. molesta** Mack.

The following specimens have been seen: "Winipeg Valley" (Bourgeau, 1859; specimen in Gray Herbarium determined by Fernald); Whitewater Lake, north of Turtle Mountain (Neufeld, 1949). First report: the present publication. This species differs only slightly from the following one, in which it is included by Gleason [1952].

Temperate American: Sask. to N.E., s. to Colo., Tenn., and Del.

39. **C. brevior** (Dew.) Mack. (*C. festucacea* Schk. var. *brevior* (Dew.) Fern.)

Dry to moist open habitats of southern Manitoba. Northernmost collection: Fort Ellice, about 70 miles northwest of Brandon (Macoun & Herriot, 1906). Earliest collection seen: Winnipeg (Macoun, 1872). Both specimens were determined by Mackenzie. First report: "Manitoba" [Mackenzie, 1931].

Temperate American: s. B.C. to Me., s. to Oreg., N.M., Ark., Tenn., and Del.

40. **C. merritt-fernaldii** Mack.

Specimens have been seen from the following localities: "Manitoba" (Waugh, 1903); Whiteshell Forest Reserve, granite outcrop (Scoggan, 1951); Melita, about 60 miles southwest of Brandon, prairie (Scoggan, 1953); Souris River north of Turtle Mountain, clearing (Scoggan, 1953). First report: "Manitoba" [Mackenzie, 1931].

Temperate American: B.C. to Que., s. to n. Calif., Kans., the Great Lakes region, and N.E.

41. **C. bicknellii** Britt.

Specimens have been seen from the following localities: Winnipeg, damp meadow (Macoun, 1872; specimen in the National Herbarium of Canada verified by both Fernald and Mackenzie); Whitewater Lake, north of Turtle Mountain (Neufeld, 1949); Brenda, near Turtle Mountain, dry places (Jackson, 1921). First report: Manitoba included in range given by Fernald [Contrib. Gray Herb. No. 22: 476. 1902].

Temperate American: Sask. to Me., s. to N.M., Ark., Ill., and Pa.

42. **C. cumulata** (Bailey) Mack.

Specimens, determined by Mackenzie, have been seen from the following localities: west of Winnipeg (Macoun, 1872); Brandon, gravelly slopes (Macoun, 1879); Fort Ellice, about 70 miles northwest of Brandon (Macoun, 1872). First report: "Manitoba" [Mackenzie, 1931].

Temperate American: Sask. to P.E.I., s. to s. Man., O., and N.E.

*C. albolutescens* Schwein.: This species was accredited to Manitoba in the range given by Fernald [Contrib. Gray Herb. No. 22: 473. 1902], but was probably based upon the above collections of *C. cumulata*, all of which were named *C. albolutescens* by Fernald before their later revision by Mackenzie. There is also a specimen from Dufferin, near Carman (Burgess, 1873) in the herbarium of McGill University, originally named *C. albolutescens*, but proving referable to *C. sartwellii*. The citation by Macoun [1888] of *C. straminea* var. *alata* from west of Portage la Prairie is probably referable to *C. cumulata*.

43. **C. projecta** Mack.

Dry to wet open ground and woodlands of the southern half of the province. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: Muskeg Creek, Lake Winnipeg, wet places (Macoun, 1884;

specimen originally named *C. tribuloides* var. *reducta*, but revised by Mackenzie). First report: "Manitoba" [Mackenzie, 1931]. The listing of *C. tribuloides* by Lowe [1943] may be referable here.

(Subarctic-)temperate eastern American: Man. to s. Lab. and Nfld., s. to Mo. and W. Va.; reported from s. B.C.

44. **C. cristatella** Britt. (*C. cristata* Schwein.)

Specimens have been seen from only the following localities: Victoria Beach, wet places (Breitung, 1949); Sandilands Forest Reserve, wet shore of small lake (Breitung, 1949). First report: Lake Winnipeg [Hooker, 1839; as *C. cristata*].

Temperate eastern American: se. Man. to sw. Que., s. to Neb., Mo., and W. Va.

45. **C. muskingumensis** Schwein. (*C. arida* Schwein. & Torr.)

A single specimen has been seen: Winnipeg, grassy prairie (Macoun, 1872; determined by Mackenzie). First report: Norway House [Hooker, 1839; as *C. arida*]. This central Manitoba citation remains to be verified.

Temperate eastern American: se. Man. to s. Ont., s. to e. Kans., Mo., and Ky.

46. **C. xerantica** Bailey

Dry prairie and open ground of southern Manitoba. Northernmost collection: Birtle, 60 miles northwest of Brandon (Macoun & Herriot, 1906). Earliest collection seen: the foregoing Birtle specimen. First report: Fernald [Contrib. Gray Herb. No. 22: 480. 1902; Manitoba included in range].

Temperate western American: Alta. to s. Man., s. to N.M., S.D., and Minn.

47. **C. adusta** Boott

Specimens have been seen from the following localities: Sandilands Forest Reserve, moist sand (Breitung, 1949); Whiteshell Forest Reserve, dry sandy clearing (Scoggan, 1951); Victoria Beach (Denike, 1942); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). First report: Emerson, south of Winnipeg [Macoun, 1888].

(Subarctic-)temperate American: Mack. to Nfld., s. to Sask., Minn., and n. N.Y.

48. **C. aenea** Fern.

Dry to wet open ground and woodlands almost throughout the province except the extreme north. Northernmost collection: Reindeer Lake at Brochet, about lat. 57° 53′ N., jack-pine woods (Baldwin, 1951). Earliest collection seen: Brandon (Malte, 1918). First report: "Manitoba" [Mackenzie, 1935].

Subarctic American: central Alaska to James Bay, n. Que., s. Lab., and Nfld., s. to Mont., S.D., Minn., and Pa.

49. **C. argyrantha** Tuckerm. (*C. foenea* of auth., not Willd.; *see* note under *C. siccata* Dew.)

A specimen from Flin Flon (Gardner, 1930) has been referred here by Porsild. First report: the present publication.

Subarctic eastern American: north-central Man. to n. Que., s. to Minn. and N.C.

50. **C. sychnocephala** Carey

Dry to wet open ground in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing in woods (Scoggan, 1949). Earliest collection seen: Washow Bay, Lake Winnipeg (Macoun, 1884). First report: "Manitoba" [Mackenzie, 1935].

(Subarctic-)temperate American: s. Yukon to sw. Que., s. to Wash., S.D., and N.Y.

51. **C. leptalea** Wahl. (*C. polytrichoides* Muhl.)

Wet woods, meadows, and clearings almost throughout the province. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: Assiniboine River (Macoun, 1879). First report: Norway House [Hooker, 1839].

Subarctic American: central Alaska and Great Bear L. to s. Keewatin, James Bay, n. Lab., and Nfld., s. to Calif., Colo., N.D., Mo., and N.C. A map of the northern part of the distribution is given by Raup [1947, pl. XVII].

52. **C. backii** Boott (*C. durifolia* Bailey)

Dry sandy or rocky open habitats in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Portage la Prairie (Macoun, 1879). First report: Lake Winnipeg [Hooker, 1839].

(Subarctic-)temperate American: s. Alta. to ne. Man. and e. Que., s. to Neb. and Pa. A map of the distribution, on which the occurrence of the species in Manitoba as far north as Gillam should be indicated, is given by Raymond [Mém. Jardin Bot. Montréal No. 20: 9. 1951].

53. **C. saximontana** Mack.

Dry sandy prairie and rocky woods in the southern third of the province. Northernmost collection: Porcupine Mountain, open woods (Scoggan & Baldwin, 1950). Earliest collection seen: Portage la Prairie, dry rocky woods (Macoun, 1879). First report: "Manitoba" [Mackenzie, 1935]. The listing of *C. willdenowii* by Lowe [1943] is undoubtedly referable to this or the preceding species.

Temperate western American: B.C. to Man., s. to Oreg., Utah, Colo., and Minn.

54. **C. filifolia** Nutt.

Dry prairie and sandhills of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, prairie slopes and sandhills (Scoggan, 1951). Earliest collection seen: plains west of Fort Garry (now Winnipeg) (Macoun, 1872). First report: Qu'Appelle Valley near Fort Ellice, about 70 miles northwest of Brandon [Macoun, 1888].

Subarctic western American: central Alaska and Great Bear L. to s. Man., s. to N.M., Tex., Neb., and Minn.; reported from ne. Lab.

55. **C. obtusata** Lilj.

Dry prairie and sandhills of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, prairie slopes and sandhills (Scoggan, 1951). Earliest collection seen: plains west of Fort Garry (now Winnipeg) (Macoun, 1872). First report: Burman [1910].

(Arctic-)subarctic western American: n. Alaska and coast of nw. Mack., s. to s. B.C., N.M., and Minn. A map of the northern part of the area is given by Raup [1930, map 21], on which the Manitoba distribution should be indicated as far north as St. Lazare.

56. **C. supina** Wahl. subsp. **spaniocarpa** (Steud.) Hult. (*C. supina* of Am. auth.)

Specimens have been seen from the following localities: Pine Ridge, near Winnipeg, dry sandy soil (Lowe, 1939; verified by Porsild); Jordan, southwest of Winnipeg, moist sand (Lowe, 1942); Nueltin Lake, lat. 59° 48′ N., flank of gravel ridge (Baldwin, 1951). First report: Nueltin Lake [Baldwin, 1953]; but the basis of the citation by Dawson [1875] of the main form from Red River.

Arctic American: central Alaska, n. coast of Mack., Baffin I., and n. Que., s. to n. Sask. and n. Minn.; Greenland. With the main form, from which it differs in its more prolonged and more evenly tapering perigynia, arctic circumpolar.

57. **C. peckii** Howe (*C. albicans* of auth., not Willd.; *C. nigro-marginata* Schw. var. *elliptica* (Boott) Gl.)

Dry to damp open soil and woodlands throughout the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, portage in woods (Scoggan, 1948). Earliest collection seen: Brandon, ravine (Macoun, 1896; determined by Mackenzie). First report: "Manitoba" [Mackenzie, 1935].

Subarctic American: north-central Alaska to central Sask., James Bay, and e. Que., s. to s. B.C., S.D., and N.Y.

*C. varia* Muhl.: the Birds Hill, Pine Ridge, Ste. Rose, Riding Mountain, and Waugh citations of Lowe [1943] are referable to *C. peckii*, the Bowsman citation to *C. concinna*, and the Victoria Beach citation to *C. pensylvanica* var. *digyna*. The Flin Flon specimen was not seen.

*C. communis* Bailey: the Gimli citation by Lowe [1943] is referable to *C. peckii*. The Cawdor specimen was not seen.

58. **C. pensylvanica** Lam. var. **digyna** Böck. (*C. heliophila* Mack.)

Dry prairie, sandhills, thickets, and woodlands of southern Manitoba. Northernmost collection: Riding Mountain (Halliday, 1932) (a specimen from Qu'Appelle Valley (Macoun, 1879) was probably collected west of the Manitoba boundary). Earliest collection seen: Assiniboine Rapids, dry open woods (Macoun, 1879). First report: "Manitoba" [Mackenzie, 1935]. Basis of earlier citations of the main form.

Temperate American: Alta. to Ont., s. to N.M., Kans., O., and N.Y.

59. **C. deflexa** Hornem.

Rock outcrops, shores, open woods, and clearings almost throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60°. N., dry rocky tundra (Scoggan & Baldwin, 1950). Earliest collection seen: various localities along the Nelson-Hayes system (Scoggan, 1949). First report: Raup [1947; map, pl. XVIII, showing a station in the Norway House area].

(Arctic-)subarctic American: central Alaska and Great Bear L. to s. Keewatin, n. Lab., and Nfld., s. to B.C., the Great Lakes region, and N.E.; s. Greenland.

60. **C. rossii** Boott

Dry prairie, sandhills, open woods, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Birtle and St. Lazare, about 75 miles northwest of Brandon (Macoun & Herriot, 1906). First report: "Manitoba" [Mackenzie, 1935].

Subarctic western American: s. Alaska and central Yukon to n. Alta., central Man., and w. Ont., s. to Calif., Colo., S.D., and Mich. A map of the northern part of the distribution is given by Raup [1930, map 20], on which the occurrence of the species in Manitoba should be indicated.

61. **C. tonsa** (Fern.) Bickn. (*C. umbellata* Schk. var. *tonsa* Fern.)

Specimens have been seen from the following localities: Sandilands Forest Reserve, sandy pine woods (Breitung, 1949); Whiteshell Forest Reserve, dry sandy clearing (Scoggan, 1951); Lac du Bonnet, open sandy pine woods (Breitung, 1949); Victoria Beach, sandy jack-pine clearing (Breitung, 1949; Scoggan, 1953); Sasaginnigak Lake, about 125 miles northeast of Winnipeg (Breitung, 1949). First report: the present publication.

(Subarctic-)temperate American: n. Alta. to e. Que., s. to Minn., Ind., and Va.

62. **C. scirpoidea** Michx.

Bogs, shores, and rocky ground almost throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Badger Creek (Burgess, 1874). First report: between Badger Creek and Turtle Mountain [Dawson, 1875].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (n. to Devon I.), n. Lab., and Nfld., s. to B.C., Colo., Man., Mich., and n. N.E.; southern half of Greenland; n. Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XVIII].

62a. **C. scirpoidea** var. **scirpiformis** (Mack.) O'Neill & Duman (*C. scirpiformis* Mack).

Specimens have been seen from the following localities: Assiniboine River, wet boggy meadows (Macoun, 1879; determined by Mackenzie); Gillam, about 165 miles south of Churchill (Schofield, 1950; determined by Calder); Churchill (Duman, 1938). First report: "Manitoba" [Mackenzie, 1935].

(Arctic-)subarctic American: n. Man. to Lab., s. to Mont., N.D., and w. Nfld. Scarcely deserving of varietal status.

63. **C. pedunculata** Muhl.

Specimens have been seen from the following localities: Seven Sisters Falls, about 50 miles east-northeast of Winnipeg, rich elm-ash woods (Scoggan, 1953); Riding Mountain (Rowe, 1948); Duck Mountain (Halliday, 1935). First report: Norway House [Hooker, 1839].

(Subarctic-)temperate American: B.C. to Nfld., s. to S.D., O., N.E., and Ga.

64. **C. concinna** R. Br.

Cool woods and mossy clearings almost throughout the province except the southwestern prairie region and the extreme north. Northernmost collection: Churchill (Polunin, 1936; Gillett & Cody, 1948). Earliest collection seen: Pipestone Creek, southwest of Brandon (Macoun, 1880). First report: "Manitoba" [Mackenzie, 1935].

Subarctic American: north-central Alaska, Mack. R. Delta, and Great Bear L. to s. Keewatin, James Bay, s. Lab., and Nfld., s. to Colo., S.D., Mich., and N.B. A map of the greater part of the distribution is given by Raup [1947, pl. XVIII].

65. **C. richardsonii** R. Br.

Sandy prairie, woods, and rock outcrops of the southern half of the province. Northernmost collection: Wekusko Lake, about 80 miles northeast of The Pas, dry limestone outcrop at south end of lake (Scoggan, 1949). Earliest collection seen: Stony Mountain, near Winnipeg, rocks (Macoun, 1896). First report: Norway House [Hooker, 1839].

(Subarctic-)temperate American: n. B.C. and n. Alta. to central Man. and w. Que., s. to S.D., O., and N.Y. A map of the greater part of the distribution is given by Raup [1930, map 29]

66. **C. rupestris** All.

Known in Manitoba only from Churchill, where it was collected in 1934 by both Polunin and Shelford. It is a species of rocky barren habitats. First report: Fernald [1950; ne. Manitoba included in range].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., n. Lab., and Nfld., s. to n. Mont., ne. Man., and e. Que.; Greenland; Iceland; Spitsbergen; n. Eurasia. A map of the world distribution is given by Raymond [1950, fig. 14].

67. **C. glacialis** Mack. (*C. pedata* Wahl.)

Known in Manitoba from the following localities: Churchill (several collections, the first by Polunin in 1934); Nueltin Lake, lat. 59° 48′ N., barren exposed island (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barrens and hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Baralzon Lake [Scoggan, 1952].

Arctic American: n. coast of Alaska and Mack., Can. Arct. Arch. (to central Ellesmereland), n. Que., and n. Lab., s. to s. Alaska, n. Man., James Bay, and central Que. (represented in Nfld. by the closely related *C. terrae-novae* Fern.); Greenland; Iceland.

68. **C. eburnea** Boott

Woods, sandhills, and clearings throughout the southern three-quarters of the province. Northernmost collection: Nelson River at confluence of Roblin River, about 25 miles southeast of Port Nelson, woods (Scoggan, 1949). Earliest collection seen: Wilkins Point, Lake Winnipegosis (Macoun, 1881). First report: Cedar Lake, north of Lake Winnipegosis [Hooker, 1839].

Subarctic American: se. Alaska and n. Mack. to north-central Man., James Bay, and Nfld., s. to B.C., Man., Tex., Ala., and Va.

69. **C. rufina** Drej.

This species is admitted into our flora on the basis of a collection by Baldwin on a gravel spit of Nueltin Lake, lat. 59° 48′ N. The specimen is annotated by Porsild as follows "Differs from typical *C. rufina* by paler scales having more prominent midveins, paler and more prominently nerved perigynia and by the terminal spikelets being not so strictly gynaecandrous (in some even androgynous). Perigynia only rarely with a few teeth in the upper part." First report: Nueltin Lake, gravel spit [Baldwin, 1953; *C.* sp. nearest *C. rufina* Drej.] The typical plant has been collected by Porsild in southern Keewatin, about 125 miles east-northeast of the above Manitoba station, the only other record of the species for North America; [*see* Porsild, Sargentia 4: 19. 1943].

Subarctic amphi-Atlantic: s. Keewatin and n. Man.; southern half of Greenland; Iceland.

70. **C. bicolor** Bellardi

Known in Manitoba only from Churchill, where it was first collected by Porsild in 1930. First report: Churchill [Størmer, 1933].

(Arctic-)subarctic circumpolar: n. Alaska and n. coast of Mack. to s. Baffin I. and n. Que., s. to s. Alta., n. Man., James Bay, and Nfld.; southern half of Greenland; Iceland; n. Eurasia.

71. C. **garberi** Fern. (Incl. var. *bifaria* Fern.)

Specimens have been seen from the following localities: Brandon, marshy place (Macoun, 1880); Nelson River about 15 miles southwest of Port Nelson, gravel-cobble beach (Scoggan, 1949); Churchill (wet moss, Duman, 1938; Core, 1948). First report: the present publication. Probable basis of reports of *C. hassei* from the province.

(Arctic-)subarctic American: north-central Alaska and Mack. R. Delta to n. Man., James Bay, and e. Que., s. to s. B.C., Ont., Ind., and N.Y. Maps of the distribution, on which the occurrence of the species in Manitoba should be indicated, are given by Fernald [Rhodora 37: 255. 1935] and Raup [1947, pl. XVIII].

72. **C. aurea** Nutt.

Meadows, damp woods, and shores throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: York Factory (McTavish, 1853–54). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

Subarctic American: central Alaska to n. Man., James Bay, south-central Lab., and Nfld., s. to Calif., N.M., Neb., and Pa.

73. **C. livida** (Wahl.) Willd. var. **grayana** (Dew.) Fern.

Known in Manitoba only from Sewell (now Camp Hughes), near Brandon, where it was collected in a marsh by Macoun in 1896. First report: Lowe [1943]; but the citation "Northern Manitoba to Eskimo Point" remains to be verified.

Subarctic American: central Alaska and n. Mack. to central Sask., James Bay, south-central Lab., and Nfld., s. to n. Calif., Ida., Sask., the Great Lakes region, and N.Y.

74. **C. tetanica** Schkuhr

Known in Manitoba from the following localities: Assiniboine Rapids, near Brandon, wet meadow and moist prairie (Macoun, 1879; determined by Mackenzie); Brandon, wet ground (Macoun, 1876; determined by Mackenzie); Jordan, southwest of Winnipeg, bogs and wet prairie (Lowe, 1942); Napinka, southwest of Brandon, hummocky meadow (Scoggan, 1953); Virden, about 45 miles west of Brandon, wet ground (Scoggan, 1953). First report: Burman [1910].

Temperate eastern American: se. Sask. to Mass., s. to S.D. and Va. A map of the distribution is given by Fernald [Rhodora 43: 503 (map 4). 1941].

75. **C. meadii** Dew.

Meadows and prairie of southern Manitoba. Northernmost collection: confluence of the Qu'Appelle and Assiniboine Rivers, about 75 miles northwest of Brandon (Macoun & Herriot, 1906; determined by Mackenzie). Earliest collection seen: Turtle Mountain, low open prairie (Burgess, 1873). First report: "Manitoba" [Mackenzie, 1935].

Temperate eastern American: se. Sask. to Pa., s. to Tex. and Ga.

76. **C. woodii** Dew. (*C. colorata* Mack.; *C. tetanica* var. *woodii* (Dew.) Wood)

Specimens have been seen from the following localities: Brandon, meadows (Macoun, 1880; determined by Mackenzie); Portage la Prairie (Jackson, 1924). First report: "Manitoba" [Mackenzie, 1935].

Temperate eastern American: s. Man. to Conn., s. to Mo. and W. Va.

*C. panicea* L.: the Winnipeg citation by Bourgeau, in Palliser [1863] is probably referable to one of the preceding four species.

77. **C. vaginata** Tausch (*C. saltuensis* Bailey)

Wet meadows, shores, and damp woods throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Brandon, ravine (Macoun, 1896; determined by Mackenzie). First report: "Point du Chien, Man." [Macoun, 1888].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Victoria I., s. Baffin I., n. Que., south-central Lab., and Nfld., s. to s. B.C., the Great Lakes region, and N.Y.; w. Greenland; Iceland; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XVIII].

*C. debilis* Michx., cited by Hooker [1839] from "Canada to Norway House", is perhaps referable to *C. vaginata*.

78. **C. blanda** Dew. (*C. laxiflora* Lam. var. *blanda* (Dew.) Boott)

Known in Manitoba from the following localities: Brandon (Malte, 1911); Whiteshell Forest Reserve east of Winnipeg, woods, (Scoggan 1951). It is a species of meadows, thickets, and woodlands. First report: the present publication.

Temperate eastern American: s. Man. to sw. Que., s. to e. Tex. and Ga.

*C. plantaginea* Lam.: southeastern Manitoba is included in the range given by Fernald [1950], and the species is cited by Hooker [1839] from Norway House. No specimens have been seen, however, and it must be excluded from our flora for the present.

79. **C. granularis** Muhl. (Incl. var. *haleana* (Olney) Porter)

Wet ground in the southern part of the province. Northernmost collection: Swan River, north of Duck Mountain (Jackson, 1922). Earliest collection seen: Assiniboine Rapids, east of Brandon (Macoun, 1879). First report: "Damp prairies, from Winnipeg west to Brandon" [Macoun, 1888].

Temperate eastern American: Sask. to e. Que., s. to Kans. and Va.

80. **C. crawei** Dew.

Meadows and shores of southern Manitoba. Northernmost collection: Bowsman, off the southeast edge of Porcupine Mountain (Jackson, 1922). Earliest collection seen: Assiniboine Rapids, east of Brandon (Macoun, 1879). First report: Winnipeg [Bourgeau, in Palliser, 1863].

Temperate American: Alta. to e. Que., s. to Wash., Ala., and N.Y.

81. **C. gracillima** Schwein.

Specimens have been seen from the following localities: Silver Falls, about 60 miles northeast of Winnipeg (Simpson, 1948); Lac du Bonnet, about 50 miles northeast of Winnipeg, damp shaded woods (Breitung, 1949); Seven Sisters Falls, south of Lac du Bonnet, rich elm woods (Scoggan, 1951); Whiteshell Forest Reserve, woods (Scoggan, 1951). First report: Norway House [Hooker, 1839].

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Mo., Tenn., and N.C.

82. **C. castanea** Wahl.

Known in Manitoba only from Sandilands Forest Reserve southeast of Winnipeg, where it was collected in a damp thicket by Breitung in 1949. First report: the present publication.

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to the Great Lakes region and N.E.

83. **C. assiniboinensis** Boott

Specimens have been seen from the following localities: Winnipeg (several collections, the first by Macoun in 1896); Otterburn, south of Winnipeg, thickets (Macoun, 1896); Portage la Prairie, woods (Macoun & Herriot, 1906; Jackson, 1924); The Narrows, Lake Manitoba, grassy thickets (Macoun, 1881); Huddlestone, near the south end of Lake Manitoba, oak-maple bluff (A. & D. Löve, 1953); Delta, near the south end of Lake Manitoba, dune forest (A. & D. Löve, 1952); Assiniboine Rapids, east of Brandon, grassy thickets (Macoun, 1879; isotype). First report: Assiniboine Rapids and Lake Manitoba [Boott, Bot. Gaz. 9: 92.1884]. The Bowsman River citation of Lowe [1943] is referable to *C. vaginata.*

Temperate (interior) American: s. Man. to Wisc., s. to S.D. and n. Ia.

84. **C. capillaris** L.

Known from the following Manitoba localities: York Factory (McTavish, 1854); Churchill (several collections, the first by Gardner in 1930); Nueltin Lake, lat. 59° 48′ N., wet sedge meadow (Baldwin, 1951). First report: Assiniboine Rapids, east of Brandon [Macoun, 1888]; this specimen, however, is referable to var. *elongata*.

Arctic circumpolar: n. coast of Alaska and Mack., Can. Arct. Arch. (n. to s. Ellesmereland), n. Que., n. Lab., and Nfld., s. to B.C., Utah, Colo., n. Man., James Bay, and N.H.; Greenland; Iceland; n. Eurasia. A map of the American distribution of the inclusive species is given by Raup [1947, pl. XVIII].

84a. **C. capillaris** var. **major** Blytt (Incl. var. *porsildiana* Polunin).

Known in Manitoba only from Churchill, where it was first collected by Porsild in 1930. First report: the present publication.

(Arctic-)subarctic American: n. Alaska and n. coast of Mack. to s. Baffin I., s. to s. Alta., n. Man., and the southeast coast of Hudson Bay; Greenland.

84b. **C. capillaris** var. **elongata** Olney (forma *major* Kük., not var. *major* Blytt)

Thickets, shores, and damp woods throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Assiniboine Rapids east of Brandon, "moist margins of lakes and rivers" (Macoun, 1879). First report: Assiniboine River [Fernald, Contrib. Gray Herb. No. 22: 510. 1902]

Subarctic circumpolar: n. Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, e. Que., and Nfld., s. to Sask., the Great Lakes region, and N.Y.; Eurasia.

85. **C. williamsii** Britt.

Known in Manitoba from the following localities: Churchill (several collections, the first by Macoun in 1910); Nueltin Lake, lat. 59° 48′ N., drying mud (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barrens (a characteristic species of stone polygon formations caused by frost action) (Scoggan & Baldwin, 1950). First report: "Manitoba" [Mackenzie, 1935].

(Arctic-)subarctic American: n. coast of Alaska, Yukon, and Mack. to central Keewatin and n. Que., s. to se. Alaska, n. Man., and James Bay. A map of the distribution is given by Raymond [Naturaliste Canadien 77: 223. 1950]. According to Hultén [1942], the eastern Asiatic *C. novograblenovii* should perhaps be referred to this species.

86. **C. sprengelii** Dew. (*C. longirostris* Torr.)

Thickets, rocky woods, and shores of southern Manitoba. Northernmost collection: Riding Mountain (Rowe, 1948). Earliest collection seen: Portage la Prairie, grassy thickets (Macoun, 1879). First report: Souris River, damp ground [Dawson, 1875].

Temperate American: Alta. to N.B., s. to Colo., Neb., and Pa.

87. **C. viridula** Michx. (*C. oederi* Retz. var. *viridula* Kük.; *C. flava* L. var. *viridula* Bailey)

Specimens have been seen from the following localities: Brandon, boggy ground (Macoun, 1896); Teulon, about 30 miles north of Winnipeg (Peterson, 1929); Riding Mountain (Lowe, 1940); Gypsumville, about 125 miles north of Portage la Prairie, weathered gypsum at quarry (Scoggan, 1951); Berens Island, Lake Winnipeg, about 160 miles north of Winnipeg (O'Donahue, 1918); Warren Landing, Lake Winnipeg, near Norway House (Lowe, 1918). First report: although cited in the synonymy of *C. oederi* by Hooker [1839] from Lake Winnipeg, this may quite reasonably be taken as the first report. Macoun [1888, p. 140] followed the same procedure, but later [1890, p. 379] referred the citation to *C. flava* var. *viridula*.

Subarctic American: s. Yukon and Great Bear L. to central Man., James Bay, and Nfld., s. to Calif., N.M., N.D., and Pa.; s. Greenland; Iceland.

88. **C. flava** L.

Known in Manitoba from the following localities: Aweme, about 20 miles southeast of Brandon (Criddle, 1939); Carberry, about 25 miles east of Brandon (Jackson, 1921); Cowan, off the northeastern edge of Duck Mountain, marshy ground (Scoggan & Baldwin, 1950); Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground (Scoggan, 1948). First report: Lake Winnipeg [Hooker, 1839].

Subarctic American: west-central Alaska to central Man., n. Ont., and Nfld., s. to Mont., Minn., Ind., and Pa.; w. Europe. A map of the distribution (incomplete in northwestern America) is given by Raymond [Mém. Jardin Bot. Montréal No. 20: 10. 1951].

89. **C. atrofusca** Schk.

Specimens have been seen only from Churchill, the earliest collection seen being one by Macoun in 1910. First report: Churchill [Gardner, 1937]; the species is also reported from near The Pas by Gardner, but this citation remains to be verified. A confusion of labels is probably involved.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can Arct. Arch. (to n. Ellesmereland), n. Que., and n. Lab., s. to central Alaska, n. Man., and James Bay; Greenland; n. Eurasia.

*C. fuliginosa* Sternb. & Hoppe., listed by Rae [1850] with plants collected between York Factory and Churchill and taken up in the synonymy of *C. misandra* R. Br. by Macoun [1888], is probably referable to the foregoing species.

90. **C. torreyi** Tuckerm. (*C. abbreviata* Schw.)

Moist to dry prairie and thickets of southern Manitoba. Northernmost collection: Riding Mountain (Lowe, 1940). Earliest collection seen: Souris River (Burgess, 1874). First report: Macoun [1888; several localities cited].

(Subarctic-)temperate western American: n. Alta. (Wood Buffalo Park) to s. Man., s. to Colo. and S.D.

91. **C. houghtonii** Torr.

Dry or moist sandy shores, clearings, and rock outcrops in the southern three-quarters of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Shoal Lake, near the Ontario boundary of southern Manitoba (Scott, 1920). First report: "Manitoba" [Mackenzie, 1935]; but the "Hudson's Bay" citation by Hooker [1839] may be based upon a Richardson collection in that part of Manitoba.

(Subarctic-)temperate eastern American: north-central Man. to James Bay and Nfld., s. to Minn. and N.E.

92. **C. lanuginosa** Michx. (*C. lasiocarpa* subsp. *lanuginosa* (Michx.) Clausen & Wahl., Rhodora 41: 31. 1939; *C. lasiocarpa* var. *latifolia* (Böck.) Gl.)

Damp meadows, swamps, and shores throughout the southern three-quarters of the province. Northernmost collection: Limestone Rapids, Nelson River, about 150 miles south of Churchill (Schofield, 1950). Earliest collection seen: Brandon, ravine (Macoun, 1896). First report: "Manitoba" [Mackenzie, 1935]; but noted by Macoun [1888] as "Very abundant in marshy meadows, throughout the prairie region".

(Subarctic-)temperate American: sw. Alaska and north-central Alta. to James Bay and interior e. Que., s. to s. Calif., Tex., and Va.

93. **C. lasiocarpa** Ehrh. var. **americana** Fern. (*C. filiformis* of auth., not L.)

Wet ground and shores in the southern half of the province. Northernmost collection seen: Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground (Scoggan, 1948). Earliest collection seen: Sewell (now Camp Hughes), near Brandon, marsh (Macoun, 1896). First report: "Manitoba" [Fernald, Rhod. 44: 304. 1942]. Basis of reports of the main form from the province, and of *C. filiformis* L. from Norway House by Hooker [1839].

Subarctic American: sw. Alaska and Great Bear L. to central Man., interior e. Que., and Nfld., s. to Wash., Ida., and Pa.; ne. Asia.

94. **C. rariflora** (Wahl.) Sm.

Known in Manitoba from the following localities: Landing Lake, Nelson River system, about 180 miles northeast of The Pas (Brown, 1950); Churchill (several collections, the first by Macoun in 1910); Nejanilini Lake, lat. 59° 22′ N., isolated muskeg stand of tamarack and black spruce (Scoggan & Baldwin, 1950); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Churchill [Størmer, 1933].

Arctic circumpolar: n. coast of Alaska and Mack., southern Can. Arct. Arch., n. Que., n. Lab., and Nfld., s. to central Alaska, James Bay, and e. Que.; southern half of Greenland; Iceland; n. Eurasia.

95. **C. limosa** L.

Bogs and muskeg of the northern three-fifths of the province, except the northeastern barren grounds. Northernmost collection: Churchill (Duman, 1938, peaty ground; Gillett, 1948). Southernmost collection: Grand Rapids, swampy ground (Scoggan, 1948). Earliest collection seen: the foregoing Duman collection. First report: Churchill [Radforth, 1950].

Subarctic circumpolar: n. Alaska and n. Mack. to s. Keewatin, central Lab., and Nfld., s. to Calif., Mont., Sask., Ia., and Pa.; Iceland; n. Eurasia.

96. **C. paupercula** Michx. (Incl. var. *irrigua* (Wahl.) Fern.)

Bogs, wet meadows, marshy shores, and muskeg throughout the province except the southwestern prairie region. Northernmost collection:

Nueltin Lake, lat. 59° 48′ N., muskeg and wet sedge meadow (Baldwin, 1951). Earliest collection seen: Swan River, north of Duck Mountain (Jackson, 1922). First report: Norway House [Hooker, 1839; *C. irrigua*].

(Arctic-)subarctic circumpolar: central Alaska to n. Man. and n. Lab., s. to Wash., Utah, Colo., Sask., Minn., and N.E.; s. Greenland; Iceland; n. Eurasia.

96a. **C. paupercula** var. **pallens** Fern.

Known in Manitoba from Riding Mountain (Rowe, 1948) and Lac du Bonnet (Breitung, 1949, spruce-tamarack swamp), north to Wekusko Lake (Scoggan, 1949, wet woods) and York Factory (Scoggan, 1949, landslide gulley by Hayes River). First report: the present publication.

Subarctic eastern American: north-central Man. to Nfld., s. to Minn. and ne. Pa.

97. **C. hallii** Olney

Known in Manitoba from the following localities: Treesbank, about 20 miles southeast of Brandon (Thomas, 1897; determined by Calder); Macgregor, east of Brandon (Macoun & Herriot, 1906); Brandon, damp prairie (Stevenson, 1951). First report: "Manitoba" [Mackenzie, 1935].

Temperate western American: Alta. to s. Man. (the inclusion of Hudson Bay in the range given by Mackenzie [1935] is probably erroneous), s. to Mont., Colo., and S.D. Perhaps not specifically distinct from the following species.

98. **C. parryana** Dew.

Dry to damp prairie and clearings of southern Manitoba. Northernmost collection: Gypsumville, about 125 miles north of Portage la Prairie, weathered gypsum strata at quarry (Scoggan, 1951). Earliest collections seen: Stony Mountain and Stonewall, near Winnipeg (Macoun, 1896). First report: Portage la Prairie to Fort Ellice, about 70 miles northwest of Brandon [Macoun, 1888].

(Subarctic-)temperate western American: s. Alaska and s. Yukon to central Alta. and central Sask., s. to s. B.C. and s. Man.

99. **C. media** R. Br. (*C. angarae* Steud.)

Moist woods and shores in the northern three-quarters of the province, except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet black spruce woods (Baldwin, 1951). Southernmost collection: Duck Mountain, woods (Scoggan & Baldwin, 1950). Earliest collection seen: Swan Lake House, Swan Lake, east of Porcupine Mountain, wet woods (Macoun, 1881; determined by Porsild). First report: Raup [1947, map pl. XVIII, showing the Swan Lake station]; this station and others indicated on a map of Fernald [Rhodora 35: 222. 1933], under the name *C. alpina* var. *inferalpina*, were later referred by Fernald [1950] to *C. media*, which he then noted as distinct from *C. inferalpina* Wahl. To both maps should be added a dot indicating the extension in Manitoba northward to Nueltin Lake.

Subarctic American: w. coast of Alaska and nw. Mack. to n. Man. and central Que., s. to s. B.C., south-central Man., the Great Lakes region, and n. N.B.

100. **C. norvegica** Retz. (*C. alpina* Sw., not Schrank; *C. halleri* of auth., not Gunn.; *C. vahlii* Schk.)

Known in Manitoba only from Churchill, where it was first collected by Macoun in 1910. It is a plant of open rocky habitats. First report: Macoun [1888; but the specimen cited from Swan Lake House is referable to *C. media*].

Arctic ?circumpolar: gap in western N. Am.; south-central Keewatin to south-central Baffin I., n. Que., and n. Lab., s. to n. Man., James Bay, and s. Lab.; southern half of Greenland; Iceland; n. Eurasia. A map of the American distribution is given by Fernald [Rhodora 35: 222. 1933].

101. **C. raymondii** Calder

Known in Manitoba only from the type locality, Gillam, about 165 miles south of Churchill, where it was collected in moist soil along the edge of a woodland road by Schofield in 1950. First report: Gillam [Calder, Rhodora 54: 248. 1952].

Subarctic western American: central Alaska and central Yukon to north-central Man., s. to s. Alta. and south-central Sask. A map of the distribution, together with that of the closely related *C. atratiformis* Britt. of eastern Canada and Maine, is given by Calder in the aforementioned publication. Both species are closely related to the Eurasian *C. atrata* L., the citation of which from Hayes River by Bell [1881] is probably referable to *C. raymondii*, although the specimen is evidently not now in existence.

102. **C. morrisseyi** Porsild [*See* A. E. Porsild, Sargentia 4: 21. 1943.]

Known in Manitoba only from Nueltin Lake, lat. 59° 48′ N., where it was collected by Baldwin in 1951. First report: the present publication.

Subarctic American (with large gaps): Great Bear L.; s. Keewatin and n. Man.; n. Que. and north-central Lab. Closely related to the following species, and probable basis of the citation of *C. adelostoma* Krecz. from Churchill by Ritchie [1956].

103. **C. buxbaumii** Wahl. (*C. polygama* Schk., not Gmel.)

Specimens have been seen from the following localities: Winnipeg, slough (Neatby, 1929); Sandilands Forest Reserve, southeast of Winnipeg, edge of swamp (Breitung, 1949). First report: Winnipeg [Bourgeau, in Palliser, 1863]. The citation of the species by Macoun [1888] from Lake Winnipeg near Norway House requires verification in the absence of a supporting specimen from this northern locality.

Subarctic circumpolar: south-central Alaska and Great Bear L. to nw. Sask., James Bay, and Nfld., s. to Calif., Colo., Ark., Ky., and N.C.; s. Greenland; Iceland; Eurasia.

104. **C. bigelowii** Torr. (*C. rigida* of auth., not Good. nor Schrank; *C. concolor* of auth., not R. Br.)

Known in Manitoba from the following localities: Churchill (Duman, 1938); Nejanilini Lake, lat. 59° 22′ N., sand-gravel ridge and isolated stand of black spruce and tamarack on dry rocky ground (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., barren exposed island (Baldwin, 1951); Baralzon Lake, lat 60° N., dry rocky barrens and hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Baralzon Lake [Scoggan, 1952].

Arctic amphi-Atlantic: Great Bear L. and n. coast of Mack., Can. Arct. Arch. (n. to Devon I. and perhaps Ellesmereland), n. Que., n. Lab., and Nfld., s. to Great Slave L., n. Man., James Bay, and N.E.; Greenland; Iceland; Spitsbergen; n. Europe.

Forma *anguillata* (Drej.) Fern. (*C. anguillata* Drej.), with perigynia narrower than in the typical form, is represented by a collection from the silted shore of Nueltin Lake by Baldwin in 1951.

105. **C. lenticularis** Michx.

Wet ground and shores throughout the province, except the south-western prairie region and the extreme north. Northernmost collection: Cochrane River, lat. 58° 13′ N., sandy shore (Baldwin, 1951). Earliest collection seen: Winnipeg, river-bank (Higham, 1924). First report: "Manitoba" [Mackenzie, 1935].

Subarctic American: central B.C. and Great Bear L. to n. Man., south-central Lab., and Nfld., s. to s. B.C., Ida., Sask., the Great Lakes region, and N.E.

106. **C. aquatilis** Wahl. (Incl. var. *altior* (Rydb.) Fern.)

Wet ground, shallow water, and shores throughout the province except the extreme north. Northernmost collection: Churchill (Macoun, 1910; Gardner, 1933). Earliest collection seen: York Factory (McTavish, 1854). First report: Emerson, Muskeg Island (Lake Winnipeg), Nelson River, and York Factory [Macoun, 1888]; the last two citations are the basis of the report of *C. stricta* from these localities by Bell [1880; 1881]; the citation by Dawson [1875] of "*C. stricta*?" from Red River may also be referable to *C. aquatilis*.

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and nw. Mack. to south-central Keewatin, n. Lab., and Nfld., s. to Calif., N.M., Neb., Mo., the Great Lakes region, and N.E.; Eurasia. A map of the greater part of the American distribution, including the following variety, is given by Raup [1947, pl. XIX].

106a. **C. aquatilis** var. **stans** (Drej.) Boott (*C. stans* Drej.)

Known in Manitoba from the following localities: Churchill (several collections, the first by Macoun in 1910; specimen determined by Porsild); Nueltin Lake, lat. 59° 48′ N., sandy lake shore (Baldwin, 1951); Baralzon

Lake, lat. 60° N., edge of lake and hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: near Hubbard Point, north of Churchill [Gröntved, 1936].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to northernmost Ellesmereland), and n. Que., s. to south-central Alta., n. Man., James Bay, and e. Que.; Greenland; n. Eurasia.

*C. vulgaris* Fries: the report of this plant from Lake Winnipeg by Macoun [1888] is probably referable to *C. aquatilis.*

*C. goodenowii* Gay: the report of this plant from northern Manitoba by Lowe [1943] is probably referable either to *C. aquatilis* var. *stans* or *C. bigelowii.*

107. **C. stricta** Lam. var. **elongata** (Böck.) Gl. (*C. emoryi* Dew.)

Specimens have been seen from the following localities: Pine Ridge, near Winnipeg, swamp (Neatby & Peterson, 1929); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, rocky shore (Breitung, 1949; distributed as *C. stricta* Lam.); Treesbank, about 20 miles southeast of Brandon (Criddle, 1939; distributed as *C. stricta*). First report: "Manitoba" [Mackenzie, 1935; as *C. emoryi*].

Temperate eastern American: s. Man. and Minn. to N.J., s. to Colo., Tex., and Fla.

108. **C. crinita** Lam.

A single specimen has been seen from Winnipeg, where it was collected by Denike in 1940. First report: "Canada to Norway House" [Hooker, 1839]. The Norway House citation remains to be verified.

(Subarctic-)temperate eastern American: Man. to Nfld., s. to Mo. and Ga.

109. **C. paleacea** Wahl. (*C. maritima* Müll.)

Known in Manitoba only from York Factory, where it was first collected by the writer on clay flats of Marsh (Beacon) Point in 1949. It is a species evidently confined entirely to coastal salt marshes and saline estuaries, and its puzzling citation by Hooker (1839) from Cumberland House (central Saskatchewan near the Manitoba boundary) remains to be verified. First report: the present publication. The report of the species by Potter [1932] from the "region just north and west of Lake Winnipeg" is based upon Hooker's Cumberland House citation.

(Subarctic-)temperate amphi-Atlantic: north-central Man., e. coast of James Bay, s. Lab., and Nfld., s. to James Bay, e. Que., and Mass.; nw. Europe. A map of the American distribution, on which the occurrence of the species at the above Manitoba locality should be indicated, is given by Potter [1932, map 5].

110. **C. salina** Wahl. var. **subspathacea** (Wormskj.) Tuckerm. (*C. subspathacea* Wormskj.)

Known in Manitoba only from Churchill, where it was first collected by Dorothy Brown in 1950 in a "sedge-covered flat cove off the west side of

Churchill River". It is a species of coastal salt marshes. First report: the present publication.

Arctic circumpolar: n. coast of Alaska and Mack., Can. Arct. Arch. (n. to Devon I.), n. Que., and n. Lab., s. to n. Man., James Bay, and e. Que.; Greenland; Iceland; n. Eurasia.

111. **C. microglochin** Wahl.

Known in Manitoba from only the following localities: Gillam, about 165 miles south of Churchill, mud flats on damp limestone (Schofield, 1950); Churchill (several collections, the first by Birket-Smith in 1923). First report: Churchill [Gröntved, 1936].

(Arctic-)subarctic circumpolar: n. coast of Alaska and Mack. to s. Baffin I., n. Que., and n. Nfld., s. to Colo., s. Alta., James Bay, and Anticosti I.; Greenland; Iceland; n. Eurasia. A map of the greater part of the American area is given by Raup [1947, pl. XIX].

112. **C. pauciflora** Lightf.

Known in Manitoba from only the following localities: Lac du Bonnet, about 50 miles northeast of Winnipeg, black spruce and tamarack swamp (Breitung, 1949); Reindeer Lake, lat. 57° 37′ N., open sphagnum bog (Baldwin, 1951). First report: Reindeer Lake [Baldwin, 1953].

(Arctic-)subarctic circumpolar: south-central Alaska and sw. Yukon to n. Man. and n. Lab., s. to Wash., the Great Lakes region, and n. Pa.; Eurasia.

113. **C. hystricina** Muhl.

Specimens have been seen from the following localities: Grand Beach, about 45 miles northeast of Winnipeg, sandy soil, moist grassy edge of lagoon (Garton, 1946); Aweme, about 20 miles southeast of Brandon (Criddle, 1926); Brandon, ravine (Macoun, 1896); confluence of Qu'Appelle and Assiniboine rivers, about 75 miles northwest of Brandon (Macoun & Herriot, 1906). The last two specimens were determined by Mackenzie. First report: Spruce Woods Forest Reserve, southeast of Brandon [Bird, 1927].

Temperate American: Wash. and Alta. to e. Que., s. to Calif., Tex., and Tenn.

114. **C. pseudo-cyperus** L.

Swamps and shallow water in the southern two-fifths of the province. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: Muskeg Creek, Lake Winnipeg (Macoun, 1884). First report: Macoun [1888].

(Subarctic-)temperate circumpolar: Sask. to Nfld., s. to N.D. and Pa.; Eurasia; n. Afr.

115. **C. lacustris** Willd. (*C. riparia* of auth., not Curtis)

Specimens have been seen from the following localities: Lake of the Woods, swamp (Dawson, 1873); Sandilands Forest Reserve, southeast of

Winnipeg, wet meadow (Breitung, 1949); Waugh, near the Ontario boundary east of Winnipeg (Jackson, 1923); Pointe du Bois, about 70 miles east-northeast of Winnipeg, edge of pond (name of collector not given); Douglas, near Brandon, hummocky swamp (Scoggan, 1953); Riding Mountain, wet sedge meadow (Scoggan, 1950). First report: Lake Winnipeg [Hooker, 1839].

Temperate American: Sask. to Anticosti I., Que., s. to Ida., S.D., and Va.

116. **C. laeviconica** Dew.

Specimens have been seen from the following localities: Brandon (marshes, Fowler, 1887, specimen determined by Mackenzie; wooded area along Assiniboine River, Stevenson, 1951); Melita, about 60 miles southwest of Brandon, alkaline soil of old Souris River channel (Scoggan, 1953). First report: the present publication. Manitoba is included in the range given by Mackenzie [1935], although he does not list the province among those from which specimens were examined.

Temperate western American: Sask. and Man., s. to Mont., Kans., Mo., and Ill.

117. **C. atherodes** Spreng. (*C. trichocarpa* Muhl. var. *aristata* (R. Br.) Bailey)

Swamps and shallow water throughout the southern three-quarters of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1857; specimen in Gray Herbarium determined by Fernald). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880]; as doubtful *C. aristata*, but taken up by Macoun [1888].

Subarctic circumpolar: sw. Alaska and south-central Yukon to north-central Man., the Great Lakes region, and N.Y., s. to Oreg., Utah, Mo., and Ind.; Eurasia. A map of the greater part of the American distribution is given by Raup [1930, map 30].

118. **C. saxatilis** L. var. **miliaris** (Michx.) Bailey

Specimens have been seen from the following localities: York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949); Cochrane River, lat. 58° 13′ N., sandy shore (Baldwin, 1951); Lamprey, about 40 miles south of Churchill (Brown, 1950); Churchill (several collections, the first by Macoun in 1910); Nejanilini Lake, lat. 59° 22′ N., sand-gravel hillock (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Churchill [O'Neill & Duman, Rhodora 43: 425. 1941; forms intermediate between this and the following variety].

(Arctic-)subarctic eastern American: n. Man., s. Baffin I., n. Lab., and Nfld., s. to James Bay and Me.; the whole species circumpolar.

Var. *major* Olney (*C. physocarpa* Presl): as noted above, forms intermediate between this and the foregoing variety occur at Churchill.

119. **C. vesicaria** L.

Swamps and shallow water in the southern half of the province. Northernmost collection seen: Norway House (Bisby, 1923); reported from Churchill River by Bell [1880]. Earliest collection seen: Winnipeg (Buller, 1918). First report: the foregoing citation of Bell.

(Subarctic-)temperate circumpolar: B.C. to central Man., s. Lab., and Nfld., s. to Calif., Colo., the Great Lakes region, and Pa.; Eurasia.

120. **C. rotundata** Wahl.

Specimens have been seen from the following localities: Lamprey, about 40 miles south of Churchill, edge of pool (Brown, 1950); Churchill (Gillett, 1948); Nejanilini Lake, lat. 59° 22′ N., marshy ground (Scoggan & Baldwin, 1950); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Churchill [Størmer, 1933]. This species is probably the basis of the report of *C. membranacea* Hook. from between Churchill and Repulse Bay by Rae [1950], and of its indication at Churchill on a map by Raup [1947, pl. XIX].

(Arctic-)subarctic western American: n. coast of Alaska and Yukon to s. Keewatin, s. to sw. Alaska and n. Man.

121. **C. rostrata** Stokes (Incl. var. *utriculata* (Boott) Bailey)

Wet ground and shallow water throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., marsh (Baldwin, 1951). Earliest collection seen: York Factory (McTavish, 1854). First report: York Factory [Bell, 1881; as *C. utriculata*]. The citations by Dawson [1875] of "*Carex ampulacea,* or *atriculata*" from Red River and Souris Valley were later taken up by Macoun [1888] under *C. rostrata* var. *utriculata.*

Subarctic circumpolar: nw. Alaska to Great Bear L., n. Man., n. Que., s. Lab., and Nfld., s. to Calif., N.M., S.D., O., Tenn., and W. Va.; s. Greenland; Eurasia. The northern Manitoba material appears to tend toward the typical form, and var. *utriculata* is the common or only representative in the southern region, but a definite statement of areas for these intergrading forms is not possible at the present time.

*C. tuckermani* Boott, assigned by Lowe [1943] to southeastern Manitoba, is probably referable to the foregoing species.

122. **C. retrorsa** Schwein.

Wet ground and shallow water in the southern half of the province. Northernmost collection: Hill Lake, north of Lake Winnipeg, limestone shingle at entry of Minago River (Scoggan, 1948). Earliest collection seen: Brandon (Fletcher, 1895). First report: Winnipeg River [Macoun, 1888].

(Subarctic-)temperate American: sw. Mack. and ne. Alta. to central Man. and e. Que., s. to Wash., Utah, Colo., S.D., and Pa.

123. **C. oligosperma** Michx.

Specimens have been seen from the following localities: Whiteshell Forest Reserve, muskeg forest (Scoggan, 1951); Tod Lake, 56° 35′ N., 101° 47′ W., swamp (Ritchie, 1955). First report: Norway House [Macoun, 1888]. The slender and small extreme has been called var. *churchilliana* by Raymond, and is cited from Churchill by Ritchie [1956].

Subarctic American: Great Slave L. to s. Man., interior Que., central Lab., and Nfld., s. to Sask., Minn., and Pa.

*C. bullata* Schk., reported by Hooker [1839] from Norway House, is probably referable to either *C. vesicaria*, *C. rostrata*, or *C. oligosperma*.

124. **C. intumescens** Rudge (Incl. var. *fernaldii* Bailey)

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg, swampy area (Wilson, undated); Sturgeon Creek, near Winnipeg (Simpson, 1940); Whiteshell Forest Reserve, east of Winnipeg, white spruce woods (Scoggan, 1951); Lac du Bonnet, about 50 miles northeast of Winnipeg, alluvial soil (Halliday, 1933); Seven Sisters Falls, about 50 miles northeast of Winnipeg, rich elm woods (Scoggan, 1951). First report: Norway House [Hooker, 1839].

(Subarctic-)temperate eastern American: Man. to Nfld., s. to Tex. and Fla.

"*C. lupulina*? Muhl.", reported by Dawson [1875] from "Winnipeg to N. W. Angle Road" is probably referable to the foregoing species.

## 19. ARACEAE

### (Arum Family)

1. Leaves narrow and sword-like; spathe (leaf below the inflorescence) appearing like a continuation of the 2-edged stem; spadix (fleshy spike) 4-9 cm. long, appearing lateral on the stem........................................1. *Acorus*

1. Leaves and spathes broad; spadices terminal.

  2. Spathe fleshy, enveloping the spadix, striped or mottled.

    3. Leaves long-petioled, with 3 ovate-acuminate leaflets; spathe 3·5-7 cm. long, its summit curved over the elongated spadix, the upper part of the latter smooth, not flower-bearing........................................2. *Arisaema*

    3. Leaves short-petioled, simple, ovate, cordate at base, becoming 3-6 dm. long; spathe shell-shaped, ovoid, with inrolled margins; spadix globular or ovoid, flower-bearing to summit........................................3. *Symplocarpus*

  1. Spathe flat and open, spreading or reflexed, ovate, petaloid, its upper surface white; spadix short-cylindric; leaves long-petioled, cordate, springing from long fleshy rhizomes........................................4. *Calla*

### 1. ACORUS L.

### (Sweetflag)

1. **A. calamus** L.

Swamps and shallow water in the southern three-quarters of the province. Northernmost collection: MacBride Lake, 56° 52′ N., 99° 57′ W. (Ritchie, 1955). Earliest collection seen: Winnipeg Beach, about

40 miles north of Winnipeg (Lowe, 1908). First report: Hayes River below Robinson Portage, east end of Robinson Lake, east-southeast of Cross Lake [Preble, 1902]; but the "Lake of the Woods" citation of Dawson [1875] may refer to the Manitoba side.

(Subarctic-)temperate American: south-central Alta. and north-central Sask. to s. James Bay and P.E.I., s. to Oreg., Tex., and Fla.; introd. in Europe.

### 2. ARISAEMA Mart.

1. **A. triphyllum** L. (*A. atrorubens* (Ait.) Blume; *see* Fernald, Rhodora 42: 247-253. 1940; Huttleston, Bull. Torrey Bot. Cl. 76: 407-413. 1949) Jack-in-the-pulpit.

Specimens have been seen from the following localities: Emerson, south of Winnipeg near the U.S. boundary (Masterson, 1931); Dufferin, near Carman, about 45 miles southwest of Winnipeg, rich woods (Burgess, 1873); Winnipeg (Simpson, 1949). First report: Dufferin [Dawson, 1875].

Temperate eastern American: se. Man. to e. Que. and N.B., s. to e. Tex. and Fla.

### 3. SYMPLOCARPUS Salisb.

1. **S. foetidus** (L.) Nutt. (*Spathyema foetida* (L.) Raf.) Skunk-cabbage

A single specimen has been seen, from Winnipegosis, east of Duck Mountain, where it was collected by Mrs. E. J. McMillan in 1924. It is a plant of wet meadows and swampy woods, the inflorescence appearing in earliest spring. First report: "Eastern Boundary" [Jackson *et al.*, 1922].

Temperate eastern American: s. Man. to e. Que., s. to Ia., Tenn., and Ga.; e. Asia (variety). A map of the distribution is given by Fernald [1929, map 3], on which the occurrence of the plant in Manitoba should be indicated.

### 4. CALLA L.

1. **C. palustris** L. Water-Arum

Bogs and shallow water throughout the province except the extreme north. Northernmost collection: Reindeer Lake at Brochet, lat. 57° 53′ N., marshy ground (Baldwin, 1951). Earliest collection seen: Lake of the Woods, Manitoba, submerged bog (Dawson, 1873). First report: "Winnipeg and N.W. Angle Road" [Dawson, 1875].

Subarctic circumpolar: central Alaska and Mack. R. Delta to n. Man. and Nfld., s. to Colo., Tex., and Fla.; Eurasia.

## 20. LEMNACEAE

### (Duckweed Family)

1. Rootlet solitary; frond (body of plant) green, 1-5-nerved....................1. *Lemna*
1. Rootlets 2-several; fronds 5-11-nerved, round-obovate, 3-8 mm. long, dark green above, purple beneath....................2. *Spirodela*

1944; Scoggan, 1953). At the latter locality there was an abundant representation of both bluish-purple-flowered and rose-pink-flowered individuals. First report (with citation of specimens): the present publication. Manitoba, however, is included in the range given by Fernald [1950].

Temperate western American: Mont. to s. Man. and w. Wisc., s. to Ariz., Tex., and La.; Mex. A map of the United States distribution is given by Anderson & Woodson [Contrib. Arnold Arb. 9: 102. 1935].

*T. virginiana* L., cited from Winnipeg by Bourgeau [in Palliser, 1863], is referable to the foregoing species, as is also the citation of *T. bracteata* Small from sandhills near Routledge and Virden in an undated supplement to Lowe's 1943 checklist.

## 22. JUNCACEAE

## (Rush Family)

1. Capsule many-seeded, the seeds minute; plants glabrous....................1. *Juncus*
1. Capsule 3-seeded, the seeds large; leaves and young stems frequently hairy..........................2. *Luzula*

### 1. JUNCUS L.

### (Rush)

1. Leaves reduced to the sheath only; inflorescence appearing lateral, the solitary involucral bract round in cross-section and resembling a continuation of the culm.
  2. Anthers 2 to 4 times the length of the filaments; stamens 6; sepals and capsule deep brown to blackish; seeds about 1 mm. long; inflorescence many-flowered, usually branched; rhizomes stout, extensively creeping............1. *J. balticus* var. *littoralis*
  2. Anthers shorter than to about equalling the filaments.
    3. Cyme compound, with forking branches, many-flowered; flowers greenish to straw-yellow or brown; stamens 3 (rarely 6); seeds about 0·5 mm. long; rhizomes stout, mostly hidden at the base of the dense tussocks.......................*J. effusus*
    3. Cyme few-flowered, with mostly simple branches; stamens 6.
      4. Anthers much shorter than the filaments; flowers greenish; seeds about 0·5 mm. long; culms filiform; rhizomes slender and cord-like..............2. *J. filiformis*
      4. Anthers about equalling the filaments; flowers dark brown; seeds about 1 mm. long; culms and rhizomes stout; plant of the Hudson Bay and northern regions...........3. *J. arcticus*
1. Leaves with a well-developed blade; inflorescence terminal (or, if sometimes appearing lateral, the short erect involucral bracts flat or channelled on the upper side).
  5. Flowers mostly borne singly in the inflorescence, not in heads, each one subtended by a pair of bractlets in addition to the one at the base of the pedicel; leaves not nodulose-septate, mostly flat.
    6. Inflorescence more than half the height of the low plant, the flowers scattered along the loose forking branches of the soft-based annual culms; leaf-sheaths gradually tapering to blade, not auricled at summit.
      7. Flowers solitary on the ultimate branches; sepals and petals pointed; seeds slenderly ovoid to ellipsoid....................................4. *J. bufonius*
      7. Flowers often in 2's or 3's, their petals obtuse at apex; seeds short-cylindric, abruptly truncated at the ends..................4a. *J. bufonius* var. *halophilus*
    6. Inflorescence much less than half the height of the stiffly erect culms; leaf-sheaths auricled or prolonged at summit.
      8. Leaf-sheaths extending about half-way up the culm; flowers 2-3·5 mm. long, their obtuse sepals with incurved tips, shorter than the capsule; rhizomes and slender stolons dark, horizontally spreading..................5. *J. compressus*

8. Leaf-sheaths confined to base or lower third of culm; sepals pointed, not incurved at tip; rhizomes short and erect.

9. Capsule longer than the perianth, closely embraced by the sepals; seeds slender, with white tail-like appendages half as long as the pale brown body; leaves nearly round in cross-section, very slightly channelled......6. *J. vaseyi*

9. Capsule shorter than the perianth; sepals and petals sharp-pointed, their tips diverging from the capsule; seeds rather plump, without tail-like appendages; leaves flat or involute.

10. Auricles at the summit of the leaf-sheaths very thin, white and scarious, the uninjured ones conspicuously prolonged 1-3 mm. beyond the point of insertion; perianth 3-4·5 mm. long; filaments much longer than anthers; leaves often one-half to quite as long as the culms............7. *J. tenuis*

10. Auricles cartilaginous, yellowish, short and rounded; perianth 4-6 mm. long; filaments slightly exceeding anthers; leaf-blades mostly less than half as long as the culms................................8. *J. dudleyi*

5. Flowers borne in heads (glomerules), each subtended only by the bractlet at the base of the very short pedicel.

11. Leaves not distinctly nodulose-septate.

12. Leaves basal, filiform or linear-filiform; head solitary; capsules rounded at summit; seeds with white tail-like appendages; tufted, non-stoloniferous, low plants of the Hudson Bay and northern regions.

13. Capsules purplish-black, with a shallow notch at apex; lowest bract of inflorescence usually well developed, erect; leaf-sheaths not conspicuously auriculate at summit....................................9. *J. biglumis*

13. Capsules pale brown, rounded at summit; involucral bracts spreading, the lowest one often not exceeding the inflorescence; leaf-sheaths conspicuously auriculate..........................................10. *J. albescens*

12. Leaves extending up the culm; heads 1-several; capsules acute to acutish; plants strongly stoloniferous.

14. Leaves strongly channelled; head usually solitary, overtopped by the lower involucral bract; seeds 2·5-3·7 mm. long, with very long tail-like appendages; plants of the Hudson Bay and northern regions.

15. Capsules brown to purplish-black....................11. *J. castaneus*

15. Capsules whitish.......................11a. *J. castaneus* var. *pallidus*

14. Leaves flat; heads 2-10, the inflorescence longer than or little exceeded by the lower involucral bract; seeds about 0·5 mm. long, merely pointed; plant of the southern regions..........................12. *J. longistylis*

11. Leaves nodulose-septate (with cross-partitions at regular intervals).

16. Heads spherical; stamens 6; capsules long-pointed; seeds merely short-pointed; culms from slender creeping tuber-bearing rhizomes.

17. Flowers 3-4 mm. long, reddish-brown; petals equalling or exceeding the sepals; heads 8-20-flowered, 7-11 mm. in diameter; tubers small..........
..................................................13. *J. nodosus*

17. Flowers 4-5 mm. long, greenish to dull brown; petals much shorter than the sepals; heads 30-80-flowered, 10-15 mm. in diameter; tubers large.........
..................................................14. *J. torreyi*

16. Heads narrower, at most hemispherical.

18. Seeds with definite tail-like appendages; stamens mostly 3.

19. Inflorescence contracted, its rays erect-ascending; heads 3-7-flowered; sepals acute; petals rather obtusish; perianth 2·5 mm. long, much shorter than the gradually pointed capsule.........15. *J. brevicaudatus*

19. Inflorescence open, its rays spreading-ascending; heads 2-many-flowered; sepals and petals pointed; perianth 3·8-5 mm. long, about equalling the round-tipped and short-beaked capsule...........16. *J. canadensis*

18. Seeds merely short-pointed; stamens 6.

20. Flowers sessile or equally short-pedicelled in rounded-hemispherical heads..........................................*J. alpinus*

20. Some of the central flowers of the ellipsoid or elongate-hemispherical heads elevated well above the others on long pedicels................
.................................17. *J. alpinus* var. *rariflorus*

### 1. LEMNA L.

### (Duckweed)

1. Fronds 6-10 mm. long, long-stalked, remaining attached in a zigzag chain, mostly entirely submersed.......................................................1. *L. trisulca*
1. Fronds sessile, 2-5 mm. in diameter, quickly becoming detached, floating on the surface. ..................................................................2. *L. minor*

1. **L. trisulca** L. Star-Duckweed

Swamps, ponds, and lakes throughout the province except the extreme north. Northernmost collection: Churchill (Gillett & Cody, 1948). Earliest collection seen: Brandon, pool (Macoun, 1896). First report: Red River prairie [Dawson, 1875].

Subarctic circumpolar: sw. Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, and Magdalen Islands, Que., s. to Calif., Fla., and Mex.; Eurasia.

2. **L. minor** L.

Swamps, ponds, and lakes in the southern half of the province. Northernmost collection: Hayes River near the west end of Knee Lake (Scoggan, 1949). Earliest collection seen: Brandon, pool (Macoun, 1896). First report: "Common in the same localities" (as the foregoing species) [Dawson, 1875].

Subarctic circumpolar: central Alaska and Great Slave L. to central Man., James Bay, and Nfld., s. to s. Calif. and Fla.; Eurasia.

### 2. SPIRODELA Schleid.

1. **S. polyrhiza** (L.) Schleid. Water-flaxseed

Specimens have been seen from the following localities: Whiteshell River, se. Man. (Simpson, 1941); Whiteshell Forest Reserve east of Winnipeg, shallow stream (Scoggan, 1951); Nelson River at High Rock, about 25 miles north-northeast of Norway House, quiet lagoon (Scoggan, 1948); Cross Lake, northeast of Lake Winnipeg, shallow water (Scoggan, 1948). First report: Burman [1910]. Also reported from Spruce Woods Forest Reserve by Shimek [1927].

Temperate circumpolar: s. B.C. to se. Que., s. throughout the U.S. and much of tropical America; Eurasia.

## 21. COMMELINACEAE

### (Spiderwort Family)

### 1. TRADESCANTIA L.

### (Spiderwort)

1. **T. occidentalis** (Britt.) Smyth

Specimens have been seen from the following localities: 15 miles northeast of Melita, sw. Man., crest of sand dunes (Dore & Breitung, 1950); Routledge, about 40 miles west of Brandon, sandhills (Moody, 1923; Lowe,

1. **J. balticus** Willd. var. **littoralis** Engelm. (Incl. var. *montanus* Engelm.)

Wet ground, shores, and shallow water throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Johansen in 1929). Earliest collection seen: Lake of the Woods, Manitoba (Dawson, 1873). First report: Lake of the Woods [Dawson, 1875; var. *montanus*]. Dawson's citation of the main form from "Dufferin and Red River country generally" is referable here.

Subarctic American: central Yukon and nw. Mack. to n. Man., James Bay, n. Que., s. Lab., and Nfld., s. to s. B.C., the Great Lakes region, Mo., and Pa.; the whole species subarctic circumpolar. A map of the greater part of the American distribution of the inclusive species is given by Raup [1947, pl. XIX].

*J. effusus* L. is reported by Macoun [1888] from York Factory, although he did not list it from that locality in his appendix to the report of Bell [1881]. It is probable that the citation is referable to the foregoing species. Lowe [1943] notes it as frequent in the southeastern area, but supporting specimens have not been seen.

2. **J. filiformis** L.

Wet ground, shores, and shallow water almost throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951). Earliest collection seen: West Hawk Lake, near the Ontario boundary east of Winnipeg (Leach, 1939). First report: Morden and Roseisle [Lowe, 1943].

Subarctic circumpolar: central Alaska to s. Keewatin, n. Que., and Nfld., s. to Oreg., Utah, Wyo., and W. Va.; s. Greenland; Iceland; Eurasia.

3. **J. arcticus** Willd.

Known in Manitoba from only the following localities: Churchill (several collections, the first by Macoun in 1910); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Churchill [Ritchie, 1956].

Arctic ?circumpolar (incl. ssp. *alaskanus* Hult.): west-central Mack. to Baffin I., s. to n. Man., n. James Bay, n. Que., and n. Lab.; southern half of Greenland; Iceland; n. Europe; nw. Asia.

4. **J. bufonius** L. Toad-Rush

Wet ground, shores, and shallow water throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: Brandon, ditches and boggy places (Macoun, 1896; determined by Buchenau). First report: Warren Landing [Lowe, 1920]; but noted by Macoun [1888] as "Abundant on mud by rivers throughout the prairie region".

Subarctic circumpolar: north-central Alaska to n. Man. and Nfld., s. to Calif. and Fla.; s. Greenland; Iceland; Eurasia.

4a. **J. bufonius** var. **halophilus** Buch. & Fern. (*J. ranarius* Perr. & Song.)

Specimens have been seen from the following localities: Melita, sw. Man., alkaline prairie (Scoggan, 1951); Delta, south end of Lake Manitoba (A. & D. Löve, 1952); Ashern, about 80 miles north of Portage la Prairie, moist ditch (Scoggan, 1951); Grahamdale, about 95 miles north of Portage la Prairie, clay soil (Scoggan, 1951); Gillam, about 165 miles south of Churchill (Schofield, 1950). First report: the present publication.

(Subarctic-)temperate amphi-Atlantic: Sask. to s. Lab., s. to Colo. and N.Y.; Greenland; Europe.

5. J. COMPRESSUS Jacq.

Specimens have been seen from the following localities: Brandon, damp soil (Stevenson, 1950, 1951); Duck Bay, Lake Winnipegosis, northeast of Duck Mountain (Bondar, 1953). First report: the present publication.

Eurasian: apparently introduced in the eastern half of southern Canada.

6. **J. vaseyi** Engelm.

Wet ground and shores throughout the province except the extreme north. Northernmost collection: Reindeer Lake, lat 57° 48′ N., sandy beach (Baldwin, 1951). Earliest collection seen: Brandon, borders of marshes on the Assiniboine River (Macoun, 1879). First report: between Echimamish River and Oxford House [Bartlett, Rhodora 11: 155. 1909]; basis of the report of *J. tenuis* Willd. by Bell [1881] from that area. Bartlett also refers the citations of *J. tenuis* by Macoun [1888] to *J. vaseyi*, but the Souris River specimen (Macoun, 1883) in the National Herbarium is *J. dudleyi*.

(Subarctic-)temperate American: sw. Mack. to n. Man., James Bay, and s. Lab., s. to Utah, Colo., Ill., and N.Y.

7. **J. tenuis** Willd. (*J. macer* S. F. Gray)

Dry to wet ground in the southern half of the province. Northernmost collection: Norway House, rock crevices (Scoggan, 1948). Earliest collection seen: Delta, south end of Lake Manitoba (Jackson, 1921). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

(Subarctic-)temperate American: southernmost Alaska and B.C. to s. Lab. and Nfld., s. throughout most of the U.S.; naturalized in S. Am., Europe, and Australia.

8. **J. dudleyi** Wieg. (*J. tenuis* var. *dudleyi* (Wieg.) Hermann)

Wet ground and shores throughout the southern three-fifths of the province. Northernmost collection: Knee Lake, about 160 miles southeast of York Factory, shore (Scoggan, 1949). Earliest collection seen: Souris River, wet places (Macoun, 1883). First report: near The Pas [Gardner, 1937].

(Subarctic-)temperate American: central Yukon to north-central Man., James Bay, and Nfld., s. to Ariz., Mo., and Va.

9. **J. biglumis** L.

Known in Manitoba only from the following collection: Churchill (Dutilly, 1936). It is a species of arctic and alpine barren grounds. First report: the present publication.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to northernmost Ellesmereland), n. Que., and n. Lab., s. to s. Alta., n. Man., and central Lab.; circumgreenlandic; Iceland; Spitsbergen; n. Eurasia.

10. **J. albescens** (Lange) Fern.

Known in Manitoba from the following localities: York Factory, gravel beach of Hay Island (Scoggan, 1949); Churchill (several collections, the first by Macoun in 1910); Baralzon Lake, lat. 60° N., dry rocky barrens (Scoggan & Baldwin, 1950; a characteristic species of stone polygon formations caused by frost action). First report: Churchill [Fernald, Rhodora 26: 203. 1924].

Arctic American: n. coast of Alaska and Mack., Can. Arct. Arch. (to north-central Ellesmereland), n. Que., and n. Lab., s. to Utah, Colo., n. Man., James Bay, interior Que., and Nfld.; Greenland; in nw. N. Am. and n. Eurasia, the closely related *J. triglumis* L.

11. **J. castaneus** Sm.

Known in Manitoba from the following localities: Gillam, about 165 miles south of Churchill (Schofield, 1950); Hayes River, about 100 miles southwest of York Factory, clay banks (Scoggan, 1949); York Factory (McTavish, 1854; Scoggan, 1949, gravel beach and landslide gully); Churchill (several collections, the first by Porsild in 1930). First report: near York Factory ["H", Richardson, in Franklin, 1823].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (n. to Devon I.), n. Que., and n. Lab., s. to James Bay and e. Que., and in the mts. to N.M.; Greenland; Iceland; n. Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XIX].

11a. **J. castaneus** var. **pallidus** Hooker [*see* Hooker, 1839, p. 2; Buchenau, Monographia Juncacearum, 1890, p. 403].

Known in Manitoba from the following localities: Churchill (Macoun, 1910); Nelson River near head of tide, gravel-cobble beach (Scoggan, 1949); Hayes River about 20 miles southwest of York Factory, clay beach (Scoggan, 1949). First report: the present publication.

Distribution uncertain.

12. **J. longistylis** Torr.

Damp to wet ground in the southern two-fifths of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake

Winnipeg, swampy ground (Scoggan, 1948). Earliest collection seen: Brandon, damp thickets and boggy soil (Macoun, 1896). First report: Burman [1910].

(Subarctic-)temperate American (with large gaps in the East): B.C. to south-central Man., s. to Calif., N.M., and Neb.; n. Mich.; s. Ont.; s. James Bay; e. Que.; sw. Nfld.

13. **J. nodosus** L.

Damp to wet ground in the southern four-fifths of the province. Northernmost collection: York Factory, clay soil (Scoggan, 1949). Earliest collection seen: Elk Island, near the south end of Lake Winnipeg, boggy places (Macoun, 1884). First report: Burman [1910].

Subarctic American: central Alaska and nw. Mack. to north-central Man., James Bay, and Nfld., s. to B.C., N.M., Tex., Mo., and Va.

14. **J. torreyi** Coville (*J. nodosus* var. *megacephalus* Torr.)

Damp to wet ground of southern Manitoba. Northernmost collection: Swan River, north of Duck Mountain (Malte, 1911). Earliest collection seen: Burnside, west of Portage la Prairie, swamps and gravelly banks (Macoun, 1872). First report: "Abundant in many places in low wet situations throughout Manitoba" (northern Manitoba being then part of the Northwest Territories) [Macoun, 1888].

Temperate American: s. B.C. to s. Que. and N.Y., s. to Calif., Tex., Ala., and Va.

15. **J. brevicaudatus** (Engelm.) Fern.

Known in Manitoba from the following localities: Virden, about 40 miles west of Brandon (Groh, 1922); Reindeer Lake, lat. 57° 48′ N., sandy beach (Baldwin, 1951); Cochrane River, lat. 58° 02′ N., wet sandy shore (Baldwin, 1951). First report: Lowe [1943].

Subarctic American: n. Alta. to south-central Lab. and Nfld., s. to Minn., Pa., and N.C.

16. **J. canadensis** J. Gay

The following specimens have been seen: "Manitoba" (Macoun, 1872); Birds Hill, near Winnipeg (Denike, 1942). First report: the present publication. For a discussion of this and the preceding species, *see* Fernald [Rhodora 32: 83-88. 1930].

Temperate eastern American: s. Man. to s. Que., s. to Ill. and Ga.

17. **J. alpinus** Vill. var. **rariflorus** Hartm. (var. *insignis* Fries; *J. nodulosus* Wahl.; *J. richardsonianus* Schultes)

Moist ground and shores throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Brandon, damp and boggy places (Macoun, 1896). First report: Dawson [1875]. Reports of the typical form [Burman, 1910; Jackson *et al.*, 1922] are referable here.

Subarctic circumpolar: central Alaska and Great Bear L. to n. Man., s. Lab., and Nfld., s. to Sask., s. Alta., Neb., Minn., Ill., and N.Y.; s. Greenland; Iceland; Eurasia.

*J. articulatus* L.: reports by Lowe [1943] from Lake Winnipeg and Riding Mountain are probably referable to the foregoing species.

*J. brachycephalus* (Engelm.) Buch.: Manitoba is included in the range given by Rydberg [1932] for this species, and is included in the checklist of Lowe [1943] on this basis. No specimens have been seen, and it is likely that *J. brevicaudatus* is the species involved.

*J. dichotomus* Ell.: the inclusion of this species by Lowe [1943] is probably referable to *J. tenuis*.

*J. militaris* Bigel.: this species is included by Lowe [1943] on the basis of an earlier listing, but without statement of locality. No specimens have been seen, and its occurrence in Manitoba is unlikely.

*J. polycephalus* Michx.: the citing of a variety from "Winipeg" by Bourgeau [in Palliser, 1863] is probably referable to either *J. nodosus* or *J. torreyi*.

*J. stygius* L. var. *americanus* Buch. is cited by Lowe [1943] from Eskimo Point, Hudson Bay, north of the Manitoba boundary, with the added note that it is possibly frequent in northern Manitoba. Thus far, however, no Manitoba material has been seen.

## 2. LUZULA DC.

## (Woodrush)

[*See* Böcher, 1950.]

1. Flowers solitary (or 2, rarely 3) at the tips of the prolonged spreading and drooping rays of the inflorescence.
    2. Inflorescence a simple umbel, the rays normally unforked; flowers 2·5-4·5 mm. long; seeds subglobose, 2·5 mm. long, with a long curved tail-like appendage.................................................................1. *L. acuminata*
    2. Inflorescence a loose decompound cyme, the rays forking; flowers 2-3 mm. long; seeds smaller, unappendaged.
        3. Stem-leaves up to 10 mm. broad, usually more than 2; bracts essentially entire; anthers longer than the filaments; plant up to 6 dm. high..........2. *L. parviflora*
        3. Stem-leaves 2-5 mm. broad, 1-2, short; bracts lacerate and abundantly ciliate; anthers shorter than the filaments; plant 1-2·5 dm. high, of the Hudson Bay and northern regions............................................3. *L. wahlenbergii*

1. Flowers subsessile, crowded in spike-like clusters.
    4. Leaves with subulate tips, 1-4 mm. wide, often involute; floral bracts ciliate-fringed; plants of the Hudson Bay and northern regions.
        5. Sepals bristle-pointed; inflorescence a dense or interrupted, arching or nodding, prolonged, spiked panicle subtended at base by elongate, very slender-pointed bracts...................................................4. *L. spicata*
        5. Sepals and petals merely acute, not bristle-tipped; inflorescence a dense subcapitate corymb of glomerules, either with or without ascending to divergent rays, subtended by short, obtuse to acuminate bracts............................5. *L. confusa*
    4. Leaves with blunt callous tips, flat, often broader; floral bracts entire or merely lacerate.
        6. Caruncle (tail-like appendage of seed) well developed; perianth-segments 2·5-3·5 mm. long.
            7. Perianth longer than the capsule; heads pale brown; seeds 1·4-1·7 mm. long; leaves up to 7 mm. broad...................................6. *L. multiflora*
            7. Perianth mostly about equalling the capsule; heads blackish-brown; seeds 1·1-1·4 mm. long; leaves somewhat narrower; plant of the Hudson Bay and northern regions..............................6a. *L. multiflora* ssp. *frigida*
        6. Caruncle 0·2 mm. or less long; seeds generally less than 1·1 mm. long; perianth-segments 2-2·5 mm. long; plant of the Hudson Bay region........7. *L. groenlandica*

1. **L. acuminata** Raf. (*L. saltuensis* Fern.)

Dry to moist open ground and woods of southern Manitoba. Northernmost collection: Duck Mountain, clearings and woods (Scoggan & Baldwin, 1950). Earliest collection seen: Camper, about 75 miles north of Portage la Prairie (Hallwright, 1915). First report: Fort Garry and Notre-Dame-de-Lourdes [Lowe, 1943]; basis of the report of *Juncoides carolinae* by Jackson *et al.* [1922] from Fort Garry. According to Jones [Rhodora 53: 242-244. 1951], the name *L. acuminata* should be rejected in favour of *L. saltuensis* (or *L. carolinae*, if this last species proves identical with *L. saltuensis*).

(Subarctic-)temperate American: Sask. to s. Nfld., s. to S.D., Ind., n. Ala., and n. Ga. Closely related to the Eurasian *L. pilosa*, of which Hultén [1942] is of the opinion it should be treated as a subspecies.

2. **L. parviflora** (Ehrh.) Desv. (Incl. var. *melanocarpa* (Michx.) Buch.)

Damp to wet clearings and woods throughout the northern four-fifths of the province. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., lake shore (Baldwin, 1951). Southernmost collection: Duck Mountain, woods (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: Hayes River [Bell, 1881].

(Arctic-)subarctic circumpolar: nw. Alaska and nw. Mack. to s. Keewatin, n. Lab., and Nfld., s. to Calif., Wyo., the Great Lakes region, and N.E.; Greenland; n. Eurasia.

3. **L. wahlenbergii** Rupr.

Specimens have been seen from the following localities: Lamprey, about 30 miles south of Churchill (Brown, 1950); Baralzon Lake, lat. 60° N., dry rocky barrens (Scoggan & Baldwin, 1950). First report: the present publication.

Arctic circumpolar: nw. Alaska and Mack. R. Delta to south-central Baffin I. and n. Que., s. to s. Alaska and n. Man.; Greenland; Spitsbergen; n. Eurasia. A map of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XIX].

4. **L. spicata** (L.) DC.

Known in Manitoba only from the following collections: Nueltin Lake, lat. 59° 43′ N., sandy opening in black spruce woods (Baldwin, 1951); Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951). First report: Nueltin Lake (Baldwin, 1953].

Arctic circumpolar: sw. Alaska and Great Bear L. to south-central Baffin I., n. Que., n. Lab., and Nfld., s. to Calif., Ariz., Colo., James Bay, and N.Y.; Greenland; Iceland; n. Eurasia. A map of the greater part of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XIX].

5. **L. confusa** Lindb.

Known in Manitoba from the following localities: Churchill (several collections, the first by Polunin in 1934); Nejanilini Lake, lat. 59° 22′ N., gravel ridge (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., barren exposed island (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barrens (Scoggan & Baldwin, 1950). First report: Baralzon and Nejanilini lakes [Scoggan, 1952].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to north-central Ellesmereland), n. Que., and n. Lab., s. to s. Alta., James Bay, and N.E.; Greenland; Iceland; Spitsbergen; n. Eurasia. A map of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XIX].

6. **L. multiflora** (Retz.) Lejeune (*L. campestris* (L.) DC. var. *multiflora* (Ehrh.) Čelak.)

Known in Manitoba from the following localities: Macgregor, east of Brandon (Macoun & Herriot, 1906); Riding Mountain (Rowe, 1949). First report: Lake Winnipeg [Lowe, 1943]. The citation of *L. campestris* var. *pallescens* Wahl. from Lake Winnipeg by Hooker [1839] is probably referable here [*see* Fernald & Wiegand, Rhodora 15: 43. 1913].

(Subarctic-)temperate American: sw. Alaska to central Sask., s. Man., the Great Lakes region, e. Que., and Nfld., s. to Minn., Ky., and Va.; Greenland; Iceland; Eurasia.

6a. **L. multiflora** ssp. **frigida** (Buch.) Krecz. (L. *campestris* var. *frigida* Buch.; *see* Böcher, Meddel. om Grønl. 147, No. 7: 17 (key). 1950).

Specimens have been seen from the following localities: York Factory, dry open ground (Scoggan, 1949); Churchill (several collections, the first seen having been collected by Porsild and Gardner in 1930); Nueltin Lake, lat. 59° 48′ N., lakeshore and gravel spit (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barrens and gravelly hillocks (Scoggan & Baldwin, 1950). First report: Churchill [Ritchie, 1956].

(Arctic-)subarctic circumpolar: n. coast of Alaska and Mack. to north-central Keewatin, n. Que., and Nfld., s. to Great Bear L. and James Bay; Greenland; n. Eurasia.

Var. *contracta* Sam. is the form represented in Manitoba, although, as pointed out by Böcher in the aforementioned paper, this entity was never officially described.

7. **L. groenlandica** Böcher

A specimen (determined by Calder) has been seen from Churchill, where it was collected by Eva Beckett in 1950. A 1929 collection from Churchill by Johansen [Størmer, 1933; *L. frigida*], however, is noted by Böcher [1950] as probably referable here. First report: the present publication (in view of the uncertain status of the Johansen collection).

(Arctic-)subarctic American: nw. coast of Alaska and n. coast of Mack. to central Keewatin, n. Que., and n. Lab., s. to Great Bear L., James Bay, and north-central Lab.; Greenland.

## 23. LILIACEAE

### (Lily Family)

1. Leaves reduced to thin dry scales, the modified branchlets filiform, green; flowers small, greenish-yellow, axillary; stem bushy-branched........................1. *Asparagus*

1. Leaves with normal blades.

2. Leaves basal or nearly so (No. 12 may be sought here).

3. Fruit a blue berry; inflorescence a loose umbel of 1-8 greenish-yellow flowers 1·2-2 cm. long; leaves 1-3 dm. long, oblong or oval, ciliate, leathery in texture..2. *Clintonia*

3. Fruit a dry capsule, finally splitting; leaves chiefly linear.

4. Flowers in umbels; scape from a coated bulb........................3. *Allium*

4. Flowers in racemes; scapes from short or creeping rhizomes.........4. *Tofieldia*

2. Leaves alternate or in whorls on the stem.

5. Plant climbing by tendrils borne from the axils of the middle and upper leaves; flowers small, greenish, borne in globular umbels; fruit a blue or black berry; leaves net-veined..........................................5. *Smilax*

5. Plants not climbing, without tendrils; leaves mostly parallel-veined.

6. Flowers or inflorescences in the axils of alternate stem-leaves.

7. Perianth-segments free only at the tip; pedicels jointed near the greenish, drooping flowers; leaves broad, sessile or very short-petioled; stems from a creeping, knotted rhizome...............................6. *Polygonatum*

7. Perianth of distinct sepals and petals.

8. Flowers orange-yellow or straw-yellow, 1·5-5 cm. long (at first terminal, but the 3-angled capsules seeming axillary by the prolongation of the branches)..........................................7. *Uvularia*

8. Flowers greenish-white, pink, or rose-purple, 6-13 mm. long; fruit a cherry-red or scarlet berry....................................8. *Streptopus*

6. Flowers or inflorescence terminal.

9. Flowers solitary.

10. Leaves netted-veined, broad, in a single whorl of 3 below the erect or nodding flower; fruit a berry..............................9. *Trillium*

10. Leaves parallel-veined, alternate or in several whorls.

11. Flowers large and very showy, erect or nodding; anthers hinged to filaments by their middle; fruit a capsule; leaves elongate, alternate or whorled on a stout simple stem, this from a scaly bulb.......................................................10. *Lilium*

11. Flowers 1-4·5 cm. long; anthers fixed by their bases; leaves oblong to ovate, alternate; stems slender, usually forking, from short or elongate rhizomes.

12. Flowers orange-yellow or straw-yellow (the 3-angled capsules seeming axillary by the prolongation of the stem and branches); leaves equilateral..................................7. *Uvularia*

12. Flowers greenish; fruit a bright red or orange berry terminating stem or branches; leaves inequilateral, oblique at the sessile base.........................................................11. *Disporum*

9. Flowers in clusters.

13. Flowers large and very showy; other characters as above.......10. *Lilium*

13. Flowers medium or small.

14. Flowers in umbels; other characters as above...........11. *Disporum*

14. Flowers in racemes or panicles.

15. Fruit a capsule; styles 3, separate; sepals and petals with conspicuous basal glands; leaves linear, those of the stem few and reduced; stems from fibrous-coated bulbs...........12. *Zigadenus*

15. Fruit a berry; styles single, sometimes cleft at tip; leaves lanceolate to ovate; stems from creeping or thickish rhizomes.

16. Perianth-segments 4; leaves 2 or 3, broadest toward the cordate base...................................13. *Maianthemum*

16. Perianth-segments 6; leaves 2-several, tapering to base.........................................................14. *Smilacina*

### 1. ASPARAGUS L.

1. A. OFFICINALIS L. Garden Asparagus

Cultivated and frequently escaped. Specimens have been seen from the Winnipeg area (Lowe, 1917; A. & D. Löve, 1951; Scoggan, 1951), Portage la Prairie (Scoggan, 1953), and Reston, about 50 miles west-southwest of Brandon (Scoggan, 1951). First report: Burman [1910].

European: widely naturalized in the United States and adjacent Canada.

### 2. CLINTONIA Raf.

1. **C. borealis** (Ait.) Raf. Bluebead-Lily

Moist woods in the southern part of the province. Northernmost collection: Bissett, about 90 miles northeast of Winnipeg (Moir, 1940). Earliest collection seen: Observation Point, opposite Hecla Island, Lake Winnipeg (Macoun, 1884). First report: Lake Winnipeg [Macoun, 1888].

(Subarctic-)temperate eastern American: sw. Man. to s. Lab. and Nfld., s. to Minn., Tenn., and Ga.

### 3. ALLIUM L.

(Onion. Garlic)

1. Leaves elliptic-lanceolate, 2-6 cm. broad, shrivelling before flowering time; capsule strongly 3-lobed, each cell 1-seeded; perianth white.................... 1. *A. tricoccum*
1. Leaves linear, present at flowering time; capsule only slightly lobed, each cell with 2-several seeds; perianth usually pink to roseate.
    2. Pedicels much shorter than the flowers, the umbel subcapitate; leaves round in cross-section, hollow; plant of the low-northern regions.................................................................... 2. *A. schoenoprasum* var. *sibiricum*
    2. Pedicels equalling or exceeding the flowers; ovary and capsule with 6 crests at or just below the summit; leaves flat or channelled, not hollow.
        3. Stamens not exserted from perianth; leaves firm, channelled; bulb with coarsely fibrous outer coat.............................................. 3. *A. textile*
        3. Stamens finally exserted from perianth; outer coat of bulbs not strongly fibrous.
            4. Umbel nodding in flower; pedicels loosely arching or flexuous; leaves thin, soft and flat; scape angular.......................................... 4. *A. cernuum*
            4. Umbel erect; pedicels stiffly ascending or spreading; leaves thick, hard, rounded on back; scape round in cross-section......................... 5. *A. stellatum*

1. **A. tricoccum** Ait. Wild Leek

A specimen has been seen only from Morden, about 60 miles southwest of Winnipeg, where it was collected by W. R. Leslie in 1923. First report: Morden [Groh, 1946].

Temperate eastern American: s. Man. to N.B., s. to Ia. and Ga.

2. **A. schoenoprasum** L. var. **sibiricum** (L.) Hartm. Wild Chives

Specimens have been seen from the following localities: Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground (Scoggan, 1948); Minago River near Hill Lake, north of Lake Winnipeg, granite shore (Scoggan, 1948); Schist Lake, near Flin Flon (Freedman, 1952); Oxford

Lake, open ground (Scoggan, 1949); Hayes River 20 miles southwest of York Factory, clay beach (Scoggan, 1949); York Factory, gravel beach (Scoggan, 1949). First report: the present publication.

Subarctic circumpolar: nw. Alaska and Great Bear L. to n. Man., s. Lab., and Nfld., s. to Wash., Colo., Minn., and N.E.; Eurasia.

3. **A. textile** Nels. & Macbr. (*A. reticulatum* Fraser) Wild Onion

Dry prairie and hillsides of southern Manitoba. Northernmost collection seen: Birtle, about 60 miles northwest of Brandon, dry ground (Macoun & Herriot, 1906); but reported by Macoun [1888] from Fort Ellice, about 70 miles northwest of Brandon. Earliest collection seen: Turtle Mountain (Burgess, 1874). First report: Turtle Mountain, Assiniboine River, Brandon, and Fort Ellice [Macoun, 1888].

Temperate western American: Alta. to s. Man., s. to Nev., Utah, N.M., Neb., and Ia.

4. **A. cernuum** Roth Wild Onion

Dry prairie, sandhills, and rock outcrops in the southern half of the province. Northernmost collection: Playgreen Lake, north of Lake Winnipeg, granite headland (Scoggan, 1948). Earliest collection seen: Shoal Lake, Ontario boundary east of Winnipeg (Lowe, 1920). First report: Souris River, Turtle Mountain, and Short Creek [Macoun, 1888]; but the Lake of the Woods citation by Dawson [1875] may refer to the Manitoba shore.

Temperate American: B.C. and north-central Alta. to central Man., s. Ont., and N.Y., s. to Ariz., Tex., Mo., and Va.

5. **A. stellatum** Fraser Wild Onion

Dry prairie, sandhills, rocky slopes, and clearings in the southern two-fifths of the province. Northernmost collection: Reader Lake, north of The Pas (Reader, 1949). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: High Bluff, near Portage la Prairie [Macoun, 1888].

Temperate western American: Alta. to Man., s. to Wyo., Tex., Mo., and Ill.

*A. mutabile* Michx., reported by Christy [1887] from sandy prairie and sandhills near Carberry, is probably referable to *A. textile.*

### 4. TOFIELDIA Huds.

(False Asphodel)

1. Fruiting raceme 5-8 mm. thick, its pedicels solitary; capsules 2-3 mm. long, their seeds unappendaged; leaves strongly 2-ranked and enfolding each other at base; plant glabrous; Hudson Bay and northern regions....................................1. *T. pusilla*
1. Fruiting raceme 1-2 cm. thick, its pedicels mostly in groups of 3 or 4; capsules 4-8 mm. long, their seeds with a tail-like appendage at each end; leaves free; scape and pedicels heavily glutinous with dark glands; southern to low-northern regions....2. *T. glutinosa*

1. **T. pusilla** (Michx.) Pers. (*T. minima* (Hill) Druce; *T. palustris* of auth., not Huds.; *T. borealis* Wahl.)

Specimens have been seen from the following localities: Churchill (several collections, the first seen being that of Bell in 1879); Nueltin Lake, lat. 59° 48′ N., sedge meadow (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barrens (a characteristic species of stone polygon formations caused by frost action) (Scoggan & Baldwin, 1950). First report: "coast between York Factory and Churchill, and in the neighbourhood of Churchill" [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to nw. Victoria I.), n. Que., n. Lab., and Nfld., s. to s. B.C., Mont., Minn., Mich., and e. Que.; southern half of Greenland; Iceland; Spitsbergen; n. Eurasia. Maps of the American distribution are given by Raup [1947, pl. XX; as *T. palustris*] and Porsild [1955, fig. 8, p. 39].

2. **T. glutinosa** (Michx.) Pers.

Moist to wet ground and shores in the southern three-quarters of the province. Northernmost collection: Nelson River near confluence of Roblin River, about 25 miles west-southwest of Port Nelson, gravel beach (Scoggan, 1949). Earliest collection seen: Stony Mountain, near Winnipeg, bog (Macoun, 1896). First report: Spruce Woods Forest Reserve, larch swamp [Shimek, 1927].

Subarctic American: sw. Alaska and Great Bear L. to north-central Man., interior Lab., and Nfld., s. to Calif. and Ga. A map of the distribution of the inclusive species (incomplete in the north) is given by Hitchcock [Amer. Midland Nat. 31: 490. 1944].

### 5. SMILAX L.

### (Carrion-flower)

1. **S. herbacea** L. var. **lasioneura** (Hook.) A. DC. (*S. lasioneura* Hook.)

Sandy prairie, thickets, and woods of southern Manitoba. Northernmost collection: Dauphin, north of Riding Mountain, thicket (Scoggan & Baldwin, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: "Winipeg" [Bourgeau, in Palliser, 1863]. The typical form with leaves glabrous beneath appears to be absent from the province, although Rydberg [1932] includes Manitoba in its range. Macoun [1888] cites it from various southern Manitoba localities, but includes *S. lasioneura* in its synonymy; his Manitoba citations are referable here.

Temperate American: Sask. to s. Ont., s. to Colo., Ark., and Ga.

### 6. POLYGONATUM Mill.

### (Solomon's-seal)

1. Leaves glabrous........................................1. *P. canaliculatum*
1. Leaves pubescent on the veins beneath..............................*P. pubescens*

1. **P. canaliculatum** (Muhl.) Pursh (*P. commutatum* (R. & S.) Dietr.; *P. giganteum* Dietr.)

Thickets and woods of southern Manitoba. Northernmost collection: Lee River, 85 miles northeast of Winnipeg (Quelch, 1950). Earliest collection seen: Winnipeg River (Bourgeau, 1857). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg [Dawson, 1875]; but its citation from "R. Winipeg" by Bourgeau [in Palliser, 1863; under synonymy of *Smilacina pubescens*] is referable here.

Temperate eastern American: s. Man. to N.H., s. to Okla. and N.C.

*P. pubescens* (Willd.) Pursh is ascribed to Manitoba by Ownbey [Annals Mo. Bot. Gard. 31: 386. 1944] on the basis of a collection by Bourgeau in 1851 bearing the annotation "L. Winipeg Valley". In view of the uncertainty as to the precise locality, and the fact that no other Manitoba specimens have been seen, it is felt that this species should be excluded from our flora.

## 7. UVULARIA L.

### (Bellwort)

1. Leaves sessile, not perfoliate; capsules with three winged angles; rhizome elongate ........ 1. *U. sessilifolia*
1. Leaves perfoliate; capsules wingless; rhizome very short.
    2. Plant glaucous and glabrous; perianth-segments granular-pubescent within; stamens shorter than style ........ *U. perfoliata*
    2. Plant not glaucous, the leaves usually pubescent beneath; perianth-segments smooth; stamens exceeding the style ........ *U. grandiflora*

1. **U. sessilifolia** L.

Known in the province only from Roseisle, 15 miles south of Portage la Prairie, where it was collected by H. Marshall in 1942 and 1949. It is a species of thickets and open woods. First report: Roseisle [Lowe, 1943; as *Oakesiella sessilifolia*].

Temperate eastern American: s. Man. to N.B., s. to Mo., Ala., and Ga.

*U. perfoliata* L. is cited from Victoria Beach by Lowe [1943], but no supporting specimens have been seen, and this species should be excluded from our flora.

*U. grandiflora* Sm. is ascribed to southeastern Manitoba by Soper [Rhodora 54: 60. 1952]. No specimens have been seen, however, and the species should also be excluded from our flora for the present.

## 8. STREPTOPUS Michx.

### (Twisted-stalk)

1. Leaves clasping at base, their margins smooth; perianth greenish-white, its segments spreading or recurving from near the middle; stigma subentire to merely lobed; anthers lance-subulate, entire, much longer than the filaments ........ 1. *S. amplexifolius* var. *americanus*
1. Leaves sessile, not clasping, their margins ciliate; perianth pink or rose-purple, its segments with only the tips recurved in age; stigma 3-cleft; anthers ovate, 2-horned, shorter than to about equalling the filaments ........ 2. *S. roseus* var. *perspectus*

1. **S. amplexifolius** (L.) DC. var. **americanus** Schultes White Mandarin

Moist woods and thickets of southern Manitoba. Northernmost collection: Porcupine Mountain, cool moist woods (Macoun, 1881). Earliest collection seen: the foregoing specimen. First report: Fassett [Rhodora 37: 97. 1935, map 1, showing Porcupine Mountain station]. Reports of the main form [Macoun, 1888; Burman, 1910; Jackson *et al.*, 1922; Lowe, 1943] are referable here.

(Arctic-)subarctic American: nw. Alaska and central Yukon to south-central Man., n. Lab., and Nfld., s. to Ariz., N.M., and N.C.; s. Greenland; e. Asia.

2. **S. roseus** Michx. var. **perspectus** Fassett (Incl. var. *longipes* (Fern.) Fassett) Rose Mandarin

Moist woods and thickets of southern Manitoba. Northernmost collection: Hecla Island, Lake Winnipeg, white spruce woods (Scoggan, 1951). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857; specimen in Gray Herbarium of Harvard University, named var. *longipes* by Fassett). First report: Fassett [Rhodora 37: 100. 1935, map 3, showing foregoing station]. Reports of the main form [Fernald, Rhodora 8: 71. 1906; Jackson *et al.*, 1922] are referable here.

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to Minn., Mich., Ky., and Ga.

## 9. TRILLIUM L.

1. Leaves definitely petioled; ovary and fruit obtusely 3-angled; flower ascending, its white petals streaked with red or purple at base.............................*T. undulatum*
1. Leaves sessile or short-petioled; ovary and fruit acutely 6-angled.
   2. Ovary normally purple; petals normally brown-purple, spreading from near the base; flowers held above the leaves.......................................*T. erectum*
   2. Ovary whitish or pale; petals white to pinkish, spreading from near the middle; flowers hidden beneath the leaves on recurved peduncles.
      3. Anthers 6-15 mm. long, at least twice as long as the filaments; peduncles 3-12 cm. long; petals 1-3·5 cm. broad.......................................*T. flexipes*
      3. Anthers about equalling or slightly exceeding the filaments; peduncles 0·5-4 cm. long.
         4. Petals 5-9 mm. broad; anthers 2·5-4·5 mm. long................1. *T. cernuum*
         4. Petals 10-17 mm. broad; anthers 4-6·5 mm. long............................................................................1a. *T. cernuum* var. *macranthum*

1. **T. cernuum** L. Nodding Trillium

Damp thickets and woods of southern Manitoba. Northernmost collection: Riding Mountain, white spruce woods (Scoggan & Baldwin, 1950). Earliest collection seen: Totogan, south end of Lake Manitoba, damp woods (Macoun, 1881). First report: Jackson *et al.* [1922].

(Subarctic-)temperate eastern American: s. Man. to e. Que. and Nfld., s. to Wisc., N.E., and Ga.

1a. **T. cernuum** var. **macranthum** Eames & Wieg.

Damp thickets and woods of southern Manitoba. Northernmost collection: Portage la Prairie (Macoun & Herriot, 1906; paratype). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857; paratype). First report: Winnipeg and Portage la Prairie [Eames & Wiegand, Rhodora 25: 191. 1923].

About the range of the species. Reported also from Sask. and Mack.

*T. undulatum* Willd. (Painted Trillium): eastern Manitoba is included in the range accorded this species by Fernald [1950], but no specimens have been seen, and this is well outside the range indicated on a map of Braun [Rhodora 39: 202, map 30. 1937].

*T. erectum* L. (Purple Trillium): reported by Lowe [1943] from southeastern Manitoba, but supporting specimens are lacking.

*T. flexipes* Raf. (*T. declinatum* (Gray) Gleason; *T. gleasoni* Fern.): the citation from Emerson by Macoun [1888; as *T. erectum* var. *declinatum*] is referable to *T. cernuum* var. *macranthum*.

## 10. LILIUM L.

## (Lily)

1. Flowers erect, open-campanulate, their segments narrowed to slender claws at base, purple-spotted within.
    2. Leaves in 2-6 whorls, with often a few scattered ones below; flowers faded orange to deep orange-red.........................................1. *L. philadelphicum*
    2. Leaves mostly scattered, sometimes whorled at the upper 1-3 nodes; flowers intense red to scarlet..................................1a. *L. philadelphicum* var. *andinum*
1. Flowers nodding, orange or orange-red, the perianth-segments strongly recurving, not clawed, purple-spotted within; leaves mostly whorled, their margins (and nerves beneath) with minute spicules...........................................*L. michiganense*

### 1. **L. philadelphicum** L.

Thickets, open woods, and rock outcrops in the southern three-quarters of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, very rare by railway (Schofield, 1950). Earliest collection seen: indefinite locality (Gardner, 1930). First report: Fort Garry [Schultz, 1861]; but probably referable to the following variety.

Temperate eastern American: Man. to s. Que., s. to Ky. and N.C.

### 1a. **L. philadelphicum** var. **andinum** (Nutt.) Ker (*L. umbellatum* Pursh) Prairie-Lily

Dry prairie, sandhills, open woods, and clearings of southern Manitoba. Northernmost collection: Red Deer River, Lake Winnipegosis, black spruce woods (Scoggan & Baldwin, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: near Aweme, about 20 miles southeast of Brandon [Criddle, Can. Field-Nat. 41: 52. 1927].

Temperate American: B.C. to w. Que., s. to N.M., Neb., and Ky.

*L. michiganense* Farw.: represented in the Gray Herbarium of Harvard University by a collection from "Winipeg Valley" by Bourgeau in 1859, the basis of the report of *L. canadense* from "Winipeg" by Bourgeau [in Palliser, 1863]. In view of the fact that no later collections of this species have been made, and that Bourgeau's interpretation of the extent of the "Winipeg Valley" was, to say the least, quite liberal, it is probable that the specimen in question was not collected within the boundaries of present-day Manitoba.

### 11. DISPORUM Salisb.

1. **D. trachycarpum** (Wats.) B. & H.

Damp woods and thickets in the southern half of the province. Northernmost collection seen: The Pas (Krivda, 1950). Earliest collection seen: Manitoba House, near The Narrows of Lake Manitoba, damp thickets (Macoun, 1881). First report: "Between Norway House and Cumberland House Fort" [Hooker, 1839; as *Uvularia lanuginosa* var. *major*].

(Subarctic-)temperate American: n. B.C. and north-central Alta. to James Bay, s. to Oreg., Ariz., and N.M.; gap in eastern N. Am. A map of the distribution, incomplete in the East, is given by Jones [Contrib. Gray Herb. No. 173: 23, map 3, 1951].

*D. lanuginosum* (Michx.) Nicholson: citations of this species from Aweme and Victoria Beach by Lowe [1943] are referable to *D. trachycarpum.*

### 12. ZIGADENUS Michx.

1. **Z. elegans** Pursh (*Anticlea elegans* (Pursh) Rydb.) White Camass

Dry to moist prairie, meadows, and rock outcrops in the southern two-fifths of the province. Northernmost collection: The Pas, gravel by railway (Krivda, 1949). Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: Turtle Mountain [Macoun, 1888]; based on the citation by Dawson [1875] of *Z. glaucus* from near Turtle Mountain; (other Manitoba citations of *Z. glaucus* and *Z. chloranthus* are referable here).

(Arctic-)subarctic western American: nw. Alaska, n. Yukon, and coast of nw. Mack. to Great Bear L. and central Man., s. to Ariz., N.M., and Mo. Maps of the greater part of the distribution (but not including the Manitoba area involved) are given by Raup [1947, pl. XX] and Porsild [Can. Geog. Jour., March 1951, fig. 6, p. 25].

*Z. gramineus* Rydb. (*Toxicoscordion gramineum* Rydb.) is accredited to Manitoba by Rydberg [1932], and noted by Lowe [1943] as "Only recorded from the south-west corner of the province". No specimens have been seen, however, and this species must be excluded from our flora for the present.

### 13. MAIANTHEMUM Weber

(Wild Lily-of-the-valley)

1. Plant glabrous........................................1. *M. canadense*
1. Plant more or less pubescent........................1a. *M. canadense* var. *interius*

1. **M. canadense** Desf.

Specimens have been seen from only the following localities: Caddy Lake, east of Winnipeg near the Ontario boundary (Leach, 1939); Whiteshell Forest Reserve east of Winnipeg, white spruce woods (Scoggan, 1951). First report: "north end of Lake Winnipeg and down the Nelson River, and at Oxford House" [Macoun, 1888; but probably referable to the following variety].

(Subarctic-)temperate eastern American: se. Man. to s. Lab. and Nfld., s. to Ia., Tenn., and Ga.

1a. **M. canadense** var. **interius** Fern.

The common form of woods and rocky clearings almost throughout the province except the extreme north. Northernmost collection: Reindeer Lake, lat. 57° 14′ N., gravel ridge (Baldwin, 1951). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, rich woods (Burgess, 1873). First report: Lake Winnipeg [Fernald, Rhodora 16: 211. 1914]. Early reports of *M. bifolium* [Bourgeau, in Palliser, 1863] and *Smilacina bifolia* [Dawson, 1875; Bell, 1880, 1881] are referable here.

(Subarctic-)temperate American: sw. Mack. to n. Man., the Great Lakes region, and interior Que., s. to s. Alta., Wisc., O., and N.Y.

## 14. SMILACINA Desf.

(False Solomon's-seal)

1. Flowers short-pedicelled in a racemose panicle; leaves several on a slightly zigzag stem up to 1 m. high; rhizome thick and fleshy, knotty........................1. *S. racemosa*
1. Flowers long-pedicelled in a simple raceme; rhizome slender.
    2. Leaves 7-12, minutely downy beneath, on a stem up to 6·5 dm. high; raceme nearly sessile........................2. *S. stellata*
    2. Leaves 2-4, glabrous, on a stem up to 2 dm. high; raceme peduncled....3. *S. trifolia*

1. **S. racemosa** (L.) Desf. False Spikenard

A specimen has been seen from Shoal Lake, on the Ontario boundary east of Winnipeg, where it was collected in 1921 (name of collector not stated). The species is also reported from Riding Mountain by Halliday [1932]. First report: Jackson *et al.* [1922; as *Vagnera racemosa*].

Temperate American: B.C. to Que., s. to Ariz., and Ga.

2. **S. stellata** (L.) Desf.

Thickets, woodlands, meadows, and shores throughout the southern two-thirds of the province. Northernmost collection: Hayes River at confluence of Fox River, about 75 miles southwest of York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: Norway House (Anderson, 1851). First report: Dufferin and Pembina Mountain [Dawson, 1875].

Subarctic American: sw. Alaska and Great Bear L. to n. Ont., s. Lab., and Nfld., s. to s. Calif., N.M., O., and Va. A map of the northern part of the distribution is given by Raup [1947, pl. XX].

3. **S. trifolia** (L.) Desf.

Bogs, mossy woods, and peaty shores throughout the province. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: Churchill River [Bell, 1880].

Subarctic American: n. B.C. and south-central Mack. to s. Keewatin, n. Que., s. Lab., and Nfld., s. to s. Alta., the Great Lakes region, and Pa.; e. Asia.

## 24. AMARYLLIDACEAE

(Amaryllis Family)

### 1. HYPOXIS L.

(Stargrass)

1. **H. hirsuta** (L.) Coville (*H. erecta* L.)

Dry to damp prairie, meadows, and thickets of southern Manitoba. Northernmost collection: Moosehorn, about 90 miles north of Portage la Prairie, grassy clearing (Scoggan, 1951). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, damp prairie bordering thicket (Burgess, 1873). First report: Dufferin [Dawson, 1875].

Temperate eastern American: se. Sask. to s. Ont. and Mass., s. to Tex. and Fla.

## 25. IRIDACEAE

(Iris Family)

1. Flowers small, regular or nearly so; style branches filiform; leaves less than 6 mm. wide; stems 2-edged or winged, from fibrous roots........................1. *Sisyrinchium*
1. Flowers large, irregular, the sepals spreading or recurved, the petals spreading or erect; style branches petal-like and arching over the anthers; leaves 0·5-3 cm. broad; stems from stout creeping rhizomes..........................................2. *Iris*

### 1. SISYRINCHIUM L.

(Blue-eyed Grass)

1. **S. montanum** Greene (*S. septentrionale* Bickn.; *S. angustifolium* of auth., not Mill.)

Prairie, thickets, and rock outcrops in the southern four-fifths of the province. Northernmost collection: Churchill River between Missi Falls and the confluence of Little Churchill River (Cairnes, 1915). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873). First report: Lowe [1943].

Subarctic American: sw. Yukon and sw. Mack. to north-central Man., s. Lab., and Nfld., s. to s. B.C., Utah, N.M., Neb., and N.Y.

*S. mucronatum* Michx. is reported from southern Manitoba by Dawson [1875], and is taken up by Burman [1910], Jackson *et al.* [1922], and Lowe [1943]. It is so similar to the foregoing species, however, that further study is necessary before it can be definitely accepted as a distinct entity in our flora.

*S. campestre* Bickn. is also reported from Manitoba [Jackson *et al.*, 1922; Shimek, 1927; Lowe, 1943; Fernald, 1950], but the writer has been unable to separate it satisfactorily from *S. montanum* in the Manitoba material seen.

### 2. IRIS L.

1. Perianth yellow or yellowish....................................1. *I. pseudacorus*
1. Perianth blue-violet...............................................2. *I. versicolor*

1. I. PSEUDACORUS L. Yellow Iris

Collected by the writer in 1953 at St. Francois-Xavier, 12 miles west of Winnipeg, where the plant had escaped to dry roadside from a nearby garden. First report: the present publication.

European: spread from cultivation from Man. to Nfld. and southward.

2. **I. versicolor** L. Blue Flag

Swampy ground and shores of southern Manitoba. Northernmost collection: north of Riverton, opposite Hecla Island, Lake Winnipeg, marshy shore (Scoggan, 1951). Earliest collection seen: Lake of the Woods, Man. (Dawson, 1873). First report: "Winnipeg and N. W. Angle Road" [Dawson, 1875].

Subarctic eastern American: s. Man. to James Bay, south-central Lab., and Nfld., s. to Minn. and Pa.

## 26. ORCHIDACEAE

### (Orchis Family)

[*See* Ames, 1924; Correll, 1950.]

1. Flowers large and very showy, one of the petals (the lip) much inflated and sac-like ("moccasin"-shaped), 1·2-8 cm. long; fertile anthers 2; leaves plaited lengthwise.................................................................1. *Cypripedium*

1. Flowers smaller; lip concave or flat, not moccasin-shaped; fertile anther 1; leaves not plaited.

  2. Flower solitary; leaf solitary, basal, the scape merely with sheathing bracts.

    3. Leaf round-ovate to oval, 2-6 cm. long, the slender petiole 3-angled; flower purplish, the lip 1·5-2·3 cm. long, resembling a sugar-scoop....................2. *Calypso*

    3. Leaf linear, expanding from the sheathing bracts only after the flower opens; flower rose-purple; terminal half of the oblong lip downwardly curved, its margins minutely fringed...................................................3. *Arethusa*

  2. Flowers 2-many, in racemes or spikes.

    4. Flowers with a distinct slender and elongate spur.

      5. Flowers bicoloured, the lip white, spotted with purple, the sepals and petals roseate; leaves 2, oval, basal.......................................4. *Orchis*

      5. Flowers uniformly coloured; leaves 1-several, basal or cauline......5. *Habenaria*

    4. Flowers spurless or merely with a small basal pouch.

      6. Leaves wanting, the yellow to brown or purple fleshy stem merely with coloured sheaths; rhizome coral-like...................................6. *Corallorhiza*

      6. Leaf or leaves present (in basal-leaved species of No. 7 soon shrivelling), they and the stem with normal green colouring; plants usually without coral-like rhizomes.

        7. Leaves in a basal rosette or paired at base.

          8. Leaves spreading in a basal rosette.

            9. Leaves thin, soon shrivelling, uniformly green; flowers sessile in a more or less spirally twisted elongate spike........................7. *Spiranthes*

            9. Leaves fleshy, evergreen, with white reticulations or veins; flowers subsessile in a 1-sided or loosely spiralling spike-like raceme.......8. *Goodyera*

          8. Leaves 2, ascending, yellowish-green, strongly keeled and sheathing the stem at base, from a large bulb or corm; flowers yellowish-green, about 5 mm. broad, on short ascending pedicels......................9. *Liparis*

7. Leaves not basal, or, if so, the leaf solitary.

10. Leaves 2, nearly opposite, sessile near middle of stem; roots fibrous.......................10. *Listera*

10. Leaf solitary or leaves scattered and alternate.

11. Leaf solitary; plant from solid tubers.

12. Leaf short and broad, subbasal to about midway on scape; flowers small, greenish.......................11. *Malaxis*

12. Leaf linear to narrowly oblong, many times as long as broad, subbasal; flowers 2·5-4·5 cm. broad, showy, pink-purple.......................12. *Calopogon*

11. Leaves scattered on stem, alternate, linear-lanceolate to narrowly oblong; flowers white or creamy, in an elongate more or less spirally twisted spike; roots tuberous-thickened.......................7. *Spiranthes*

## 1. CYPRIPEDIUM L.

## (Lady's-slipper. Moccasin-flower)

1. Flowering stem a naked scape with 2 basal leaves; lip 3·5-7 cm. long, drooping, very veiny, pink or roseate, with a deep fissure in front.......................1. *C. acaule*

1. Flowering stem leafy; lip not fissured, but with a rounded opening near base.

2. Lip about 2 cm. long, strongly purplish-veined, irregularly triangular, prolonged downward at apex into a blunt conical spur-like sac; sepals all free......2. *C. arietinum*

2. Lip less strongly veined, broadly rounded at apex.

3. Lip yellow.

4. Lip 2-4 cm. long; upper sepal 2·5-5 cm. long, the 2 lateral ones united; petals 3·5-5 cm. long; largest leaves 2-9 cm. broad......3. *C. calceolus* var. *parviflorum*

4. Lip 3-5 cm. long; upper sepal 4-7 cm. long, the lateral ones united below or distinct; petals 5-9 cm. long; largest leaves 4-12 cm. broad.......................3a. *C. calceolus* var. *pubescens*

3. Lip white, suffused or veined with pink, rose, or purple.

5. Lip 3-5 cm. long, with broad pink to roseate bands in front between the narrow, vertical, white furrows; leaves 6-15 cm. broad; plant strongly glandular-hirsute throughout.......................4. *C. reginae*

5. Lip 1·2-2·3 cm. long, striped with purple; leaves 1-5 cm. broad.

6. Lip 1·8-2·5 cm. long, waxy white, smooth and shining on the outer surface, purple-veined within at base; lateral sepals united almost to apex; leaves 1-4 cm. broad; plant sparingly glandular-pubescent throughout; southern area.......................5. *C. candidum*

6. Lip 1·2-2 cm. long, white to pale magenta, lined and spotted with violet-purple, not shining; lateral sepals free almost to base or united almost to apex; leaves 1·5-5 cm. broad; plant more or less densely villous-pubescent throughout; chiefly the Hudson Bay and northern regions...........6. *C. passerinum*

1. **C. acaule** Ait. (*C. humile* Salisb.; *Fissipes acaulis* Small) Stemless Lady's-slipper

Specimens have been seen from the following localities: Whiteshell Forest Reserve, white spruce woods (Scoggan, 1951); Victoria Beach (Buller, 1928; woods, Johnson, 1928; Simpson, 1934; sandy pine woods, Breitung, 1949); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas (Bryenton, 1951). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

(Subarctic-)temperate American: reported from Great Bear L.; ne. Alta. to north-central Man., interior Que., and Nfld., s. to Minn., Ala., and Ga.

2. **C. arietinum** R. Br. (*Criosanthes arietinum* (R. Br.) House) Ram's-head Lady's-slipper

Specimens have been seen from the following localities: Richer, about 30 miles southeast of Winnipeg (Simpson, 1941); near Arborg, about 70 miles north of Winnipeg (Cumming, 1939); East Mossy Portage between Cedar Lake and Lake Winnipegosis, damp woods (Scoggan, 1948). First report: "Portage of the Grand Rapid of the Saskatchewan", near the northwest end of Lake Winnipeg [Hooker, 1839].

Temperate eastern American: south-central Man. to sw. Que., s. to Minn. and N.Y.

3. **C. calceolus** L. var. **parviflorum** (Salisb.) Fern. (*C. parviflorum* Salisb.; *C. flavescens* DC.) Small Yellow Lady's-slipper

Dry to moist open ground, thickets, and woods in the southern two-thirds of the province. Northernmost collection: Hayes River at The Rock, about 100 miles southwest of York Factory, wooded clay banks (Scoggan, 1949). Earliest collection seen: Assiniboine River, rich damp woods (Macoun, 1879). First report: "throughout Canada to Lake Winnipeg and the Rocky Mountains" [Hooker, 1839].

Subarctic American: west-central Yukon and Great Bear L. to north-central Man., e. Que., and Nfld., s. to Wash., Utah, N.M., Tex., and Ga.; the whole species circumpolar.

3a. **C. calceolus** var. **pubescens** (Willd.) Correll (*C. pubescens* Willd.) Large Yellow Lady's-slipper

Similar habitats in the southern part of the province. Northernmost collection seen: Eriksdale, about 60 miles north of Portage la Prairie (A. & D. Löve, 1952); the "Echimamish River to Oxford House" citation of Bell [1881] is probably referable to var. *parviflorum*. Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, border of damp thicket (Burgess, 1873). First report: Dufferin [Dawson, 1875].

Temperate eastern American: s. Man. to N.S., s. to Mo., Ala., and Ga.

4. **C. reginae** Walt. (*C. spectabile* Salisb.; *C. hirsutum* of auth., not Mill.) Showy Lady's-slipper

Wet ground, thickets, and wet woods in the southern third of the province. Northernmost collection: Lake Winnipegosis, black spruce muskeg near Red Deer River (Scoggan, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, border of damp thicket (Burgess, 1873). First report: Fort Garry [Schultz, 1861].

(Subarctic-)temperate eastern American: Man. to Nfld., s. to N.D., Mo., and Ga. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Fernald [Rhodora 35: 8, map 2. 1933].

5. **C. candidum** Muhl. Small White Lady's-slipper

Specimens have been seen from the following localities: Woodlands, about 30 miles northwest of Winnipeg (Bartlett, 1938); 4 miles south of Brandon (Fletcher, 1899). First report: near Brandon and Aweme [J. M. Macoun, 1903].

Temperate eastern American: s. Man. and N.D. to N.Y., s. to Mo., Ky., and Pa.

6. **C. passerinum** Richards. Small White Lady's-slipper

Bogs, shores, and damp woods throughout the province except the extreme north and the southwestern prairie region. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: north end of Lake Winnipeg, rich damp woods (Bell, 1879). First report: Churchill [Gröntved, 1936]; but credited to Manitoba in the range given by Ames [1924]. Probable basis of the citation of "*Cypripedium guttatum*, Swartz ?" by Bell [1880] from Churchill River.

Subarctic American (incl. var. *minganense* Vict.): north-central Alaska and Great Bear L. to n. Man., James Bay, and e. Que., s. to s. B.C. and Lake Superior. A map of the distribution is given by Raup [1947, pl. XX].

### 2. CALYPSO Salisb.

1. **C. bulbosa** (L.) Oakes (*C. borealis* Salisb.; *Cythera bulbosa* (L.) House)

Cool mossy woods and damp clearings in the southern half of the province. Northernmost collection: Schist Lake, near Flin Flon (Freedman, 1952). Earliest collection seen: near Pointe du Bois, about 75 miles east-northeast of Winnipeg (Thompson, 1922). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Subarctic circumpolar: central Alaska and Great Bear L. to central Man., James Bay, and Nfld., s. to Calif., Ariz., Minn., and N.E.; Eurasia.

### 3. ARETHUSA L.

1. **A. bulbosa** L. Swamp-pink

Specimens have been seen from the following localities: Richer, about 30 miles southeast of Winnipeg, swamp (Simpson, 1941); Seven Sisters Falls, about 50 miles northeast of Winnipeg (Bilbson, 1932); The Pas, sphagnum bog (Krivda, 1951). First report: Seven Sisters Falls and Cedar Lake [Lowe, 1943].

(Subarctic-)temperate eastern American: Man. to Nfld., s. to La. and S.C.

### 4. ORCHIS L.

1. **O. rotundifolia** Banks Small Round-leaved Orchis

Rich woods almost throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first seen being that of Macoun in 1910). Earliest collection seen: Lake Winnipegosis, rich damp woods (Macoun, 1881). First report: "Coast between York Factory and Churchill, and in the neighbourhood of Churchill" [Rae, 1850; as *Platanthera rotundifolia* Lindl.].

Subarctic American: n. Alaska and n. Mack. to James Bay and Nfld., s. to Mont., Minn., and N.Y.; sw. Greenland.

## 5. HABENARIA Willd.

1. Leaves basal, solitary or a single pair.
   2. Leaves 2 (rarely 3), broadly elliptic to orbicular, flat on the ground.
      3. Scape naked; flowers sessile in a strict spike; spur tapering uniformly to a sharp point........1. *H. hookeri*
      3. Scape with a solitary bract; flowers on slender pedicels; spur thickened at apex........2. *H. orbiculata*
   2. Leaf solitary, obovate, ascending........3. *H. obtusata*
1. Leaves cauline, solitary or several.
   4. Leaf solitary (rarely 2)........*H. clavellata*
   4. Leaves several.
      5. Lip fringed or deeply dissected.
         6. Flowers yellowish-green or yellowish-white; some of the fringed-segments of the lateral lobes longer than the body........*H. lacera*
         6. Flowers lilac-pink to rose-purple; fringed-segments never as long as the body of the lobe........*H. psycodes*
      5. Lip neither fringed nor dissected.
         7. Lip oblong to oblong-cuneate, the truncate apex with 2 short teeth; lower bracts 1½-6 times as long as the subtended flowers........4. *H. viridis* var. *bracteata*
         7. Lip entire at the rounded apex; lower bracts only slightly exceeding the subtended flowers.
            8. Lip oblong-oval or elliptic, gradually tapering to the blunt apex; flowers greenish or greenish-yellow........5. *H. hyperborea*
            8. Lip rhombic and dilated at base, abruptly narrowed above and with almost parallel margins to the rounded apex; flowers white........6. *H. dilatata*

1. **H. hookeri** Torr. (*Platanthera hookeri* (Torr.) Lindl.) Hooker's Orchis

Known in Manitoba from the following localities: Victoria Beach (Buller, 1917; Simpson, 1934); Caddy Lake, near the Ontario boundary east of Winnipeg (Leach, 1939); Sandilands Forest Reserve, southeast of Winnipeg (Breitung, 1949). It is a species of dryish woods. First report: Lake Winnipegosis [Jackson *et al.*, 1922; as *Lysias hookeriana*, but the specimen cited is referable to *H. orbiculata*].

Temperate eastern American: se. Man. to Que., s. to Ia. and Pa.

2. **H. orbiculata** (Pursh) Torr. (*Platanthera orbiculata* (Pursh) Lindl.) Round-leaved Orchis

Dry to moist woods of southern Manitoba. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: Swan Lake, east of Porcupine Mountain, rich woods (Macoun, 1881). First report: "Swan Lake House, and on the banks of the Red Deer River, Lake Winnipegoosis" [Macoun, 1888].

(Subarctic-)temperate American: sw. Mack. to central Man. and Nfld., s. to Wash., Mont., Minn., Ill., Tenn., and S.C. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Fernald [Rhodora 35: 87, map 9. 1933].

3. **H. obtusata** (Pursh) Richards. (Incl. var. *collectanea* Fern.; *Lysiella obtusata* (Banks) Richards.) Blunt-leaf Orchis

Damp woods throughout the province except the extreme north and the southwestern prairie region. Northernmost collection: Churchill (several collections, the first seen being that of Macoun in 1910, paratype of var. *collectanea* [*see* Fernald, Rhodora 28: 176. 1926]. Earliest collection seen: Lake Winnipegosis, rich damp woods (Macoun, 1881). First report: "Coast between York Factory and Churchill, and in the neighbourhood of Churchill" [Rae, 1850; as *Platanthera obtusata*].

(Arctic-)subarctic American: n. coast of Alaska, Yukon, and Mack. to central Keewatin, central Lab., and Nfld., s. to Colo., Minn., and N.Y. A map of the greater part of the distribution is given by Raup [1947, pl. XX].

*H. clavellata* (Michx.) Spreng. (*Denslovia clavellata* (Michx.) Rydb.) is reported from near Aweme by Criddle [1927], but no Manitoba specimens have been seen, and the report is probably referable to the foregoing species.

4. **H. viridis** (L.) R. Br. var. **bracteata** (Muhl.) Gray (Incl. var. *interjecta* Fern.; *H. bracteata* (Muhl.) R. Br.; *Coeloglossum bracteatum* (Muhl.) Parl.) Frog-Orchis

Dry to wet meadows, shores, thickets, and woods in the southern three-quarters of the province. Northernmost collection: York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857). First report: Red River prairie and Pembina Mountain [Dawson, 1875; as *Platanthera bracteata*]. Probable basis of the report of *Platanthera herbiola* by Hooker [1839] from "Between Norway House and Canada".

Subarctic American: central Alaska and sw. Mack. to north-central Man. and Nfld., s. to s. B.C., Colo., S.D., Tenn., and S.C.; e. Asia. The whole species circumpolar.

5. **H. hyperborea** (L.) R. Br. (Incl. var. *huronensis* (Nutt.) Farw.; *Limnorchis huronensis* (Nutt.) Rydb.; *L. viridiflora* (Cham.) Rydb.) Northern Green Orchis

Bogs, shores, thickets, and woods throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, boggy places (Macoun, 1879). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

Subarctic American: north-central Alaska and Great Bear L. to n. Man., n. Que., s. Lab., and Nfld., s. to Oreg., N.M., Neb., and Pa.; Greenland; Iceland; e. Asia. A map of the greater part of the distribution is given by Raup [1947, pl. XX].

6. H. **dilatata** (Pursh) Hook. (*Limnorchis dilatata* (Pursh) Rydb.) Leafy White Orchis

Specimens have been seen from the following localities: Vivian, about 25 miles east of Winnipeg, wet woods (Lowe, 1944); Onah, about 20 miles east of Brandon (Criddle, 1926); Treesbank, about 20 miles southeast of Brandon (Fyles, 1914); Duck Mountain (Halliday, 1935). First report: "Red Deer River, and along the flanks of the Porcupine Mountain, Man." [Macoun, 1888].

(Arctic-)subarctic American: south-central Alaska and south-central Yukon to n. Sask., n. Lab., and Nfld., s. to Calif., N.M., S.D., and Pa.; Iceland.

*H. lacera* (Michx.) Lodd.: Manitoba is included in the range of this species by Ames [1924], Correll [1950], and Gleason [1952], but no specimens have been seen, and it should be excluded from our flora for the present.

*H. psycodes* (L.) Spreng. is listed by Burman [1910], Jackson *et al.* [1922], and Lowe [1943], but the only collection from near our area seen by the writer is one made by Dawson in 1873, bearing the somewhat ambiguous annotation "Rainy River, near Lake of the Woods, Man." Rainy River forms part of the boundary between western Ontario and Minnesota.

*H. fimbriata* (Ait.) R. Br., similar to the preceding, is reported from "Winipeg" by Bourgeau [in Palliser, 1863; as *Platanthera fimbriata*], but supporting specimens are lacking.

## 6. CORALLORHIZA Chatelain

### (Coral-root)

1. Lip entire, tongue-shaped; perianth 0·8-2 cm. long, the conspicuously purple-veined sepals and petals forming a broad arching hood........................1. *C. striata*
1. Lip 3-lobed, the terminal lobe the largest; perianth 5-10 mm. long, often red-spotted, not striped.
    2. Lateral lobes of lip prolonged; capsules brownish or yellowish-brown; rhizomes brownish; scape up to 6 dm. high, the sheaths extending well above the middle..................2. *C. maculata*
    2. Lateral lobes of lip small; capsules greenish; rhizomes whitish; scape 0·8-3 dm. high, with 3 or 4 close sheaths toward base................................3. *C. trifida*

1. **C. striata** Lindl. Striped Coral-root

Specimens have been seen from the following localities: Winnipeg (Higham, 1921; Newton, 1927); Teulon, about 30 miles north of Winnipeg, moist woods (Peterson, 1928); Gimli, about 45 miles north of Winnipeg (Hiebert, 1917; damp woods, Scoggan, 1951); Riding Mountain (Halliday, 1932); Duck Mountain (Halliday, 1935). First report: near Aweme [Fletcher, 1900].

Temperate American: s. B.C. to e. Que., s. to Calif., Ida., Wyo., Minn., and N.Y.

2. **C. maculata** Raf. Spotted Coral-root

Dry woods in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, dry gravel ridge, jack-pine woods (Scoggan, 1938). Earliest collection seen: Winnipeg (Malte, 1911). First report: Winnipeg [Jackson *et al.*, 1922].

(Subarctic-)temperate American: north-central B.C. to James Bay, s. Lab., and Nfld., s. to Calif., Colo., S.D., Ind., Tenn., and N.C.

3. **C. trifida** Chat. (Incl. var. *verna* (Nutt.) Fern.; *C. innata* R. Br.; *C. corallorhiza* (L.) Karst.) Early Coral-root

Bogs, shores, and dry to moist woods throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Manitoba House, on The Narrows, Lake Manitoba, swamps and damp woods (Macoun, 1881). First report: "Winipeg" [Bourgeau, in Palliser, 1863; as *C. "inuata"*].

(Arctic-)subarctic circumpolar: n. coast of Alaska and Mack. to south-central Keewatin, n. Que. (Hudson Str.), central Lab., and Nfld., s. to Oreg., Colo., S.D., Mo., Tenn., and Ga.; sw. Greenland; Iceland; Eurasia. A map of the greater part of the American distribution, on which the Churchill station should be indicated, is given by Raup [1947, pl. XX].

## 7. SPIRANTHES Richard

### (Ladies'-tresses)

1. Leaves basal, present or becoming wilted at flowering time, ovate or ovate-oblong; perianth white, 4-5 mm. long; spike 1-sided and very slender, 2-16 cm. long, the flowers in a single rank........................................1. *S. gracilis*
1. Leaves partly borne on the lower part of the stem, linear-lanceolate to narrowly oblong; perianth white or creamy, 6-12 mm. long, the flowers in 2 or more ranks.
    2. Lip constricted below the apex, fiddle-shaped; lateral sepals upturned and connivent with the petals and the upper sepal as an upward-arching hood; beak of stigma short; bracts often longer than flowers..............................2. *S. romanzoffiana*
    2. Lip unconstricted; lateral sepals not upturned, free from and not connivent with the hood; beak of stigma very long and slender; bracts shorter than flowers.......*S. cernua*

1. **S. gracilis** (Bigel.) Beck (Incl. *S. lacera* Raf.) [*See* Correll, 1950, p. 197]. Slender Ladies'-tresses

Dry or moist thickets or open woods in the southern third of the province. Northernmost collection: East Mossy Portage, between Cedar Lake and Lake Winnipegosis, damp woods (Scoggan, 1948); but reported by Lowe [1943] from Flin Flon. Earliest collection seen: Observation Point, east coast of Lake Winnipeg opposite Hecla Island, crevices of rocks in woods (Macoun, 1884). First report: Burman [1910].

Temperate eastern American: Man. to Que., s. to Okla., Tenn., and N.C.

2. **S. romanzoffiana** Cham. (*S. stricta* (House) A. Nels.) Hooded Ladies'-tresses

Bogs, shores, and damp woods throughout the province except the extreme north. Northernmost collection: Churchill (Macoun, 1910). Earliest collection seen: Gods Lake, northeast of Lake Winnipeg, cool bogs (Bell, 1879). First report: Churchill and Nelson rivers [Bell, 1880].

Subarctic amphi-Atlantic: north-central Alaska and Great Bear L. to n. Man., s. Lab., and Nfld., s. to Calif., Colo., S.D., and Pa.; relic in n. Ireland and w. Scotland. A map of the distribution is given by Fernald [1929, map 39].

*S. cernua* (L.) Richard: the report of this species from Riding Mountain by Lowe [1943] is probably referable to *S. romanzoffiana*.

### 8. GOODYERA R. Br.

### (Rattlesnake-plantain)

1. Flowers 4 mm. long, in a 1-sided raceme 2·5-6 cm. long; anther short and blunt; beak shorter than body of stigma; leaves 1-3 cm. long, 5-nerved. . . 1. *G. repens* var. *ophioides*
1. Flowers 5 mm. long, in a loosely spiralling raceme 3-16 cm. long; anther acuminate; beak as long as or longer than body of stigma; leaves 2-7 cm. long, 5-9-nerved. . . . . . . . . . . . *G. tesselata*

1. **G. repens** (L.) R. Br. var. **ophioides** Fern. (*G. ophioides* (Fern.) Rydb.)

Damp mossy woods in the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 14′ N., gravel ridge (Baldwin, 1951). Earliest collection seen: Bloodvein River, near The Narrows, Lake Winnipeg, crevices of rocks in woods (Macoun, 1884). First report: Lake Winnipeg [Jackson *et al.*, 1922; as *Peramium ophioides*]. Earlier reports of the main form are referable here.

Subarctic American: central Alaska and Great Bear L. to Lake Superior, s. Lab., and Nfld., s. to B.C., Minn., Tenn., and N.C.; the whole species, of which the greater part of the American distribution is given in map by Raup [1947, pl. XX]., circumpolar.

*G. tesselata* Lodd.: eastern Manitoba is included in the range accorded this species by Fernald [1950], but, in the apparent absence of supporting specimens, it seems best to exclude it from our flora for the present.

### 9. LIPARIS Richard

1. **L. loeselii** (L.) Richard Yellow Twayblade

Specimens have been seen from the following localities: Petrel, about 50 miles northeast of Brandon, marsh (Macoun & Herriot, 1906); Carberry, about 25 miles east of Brandon (Macoun & Herriot, 1906); Rennie, about 65 miles east of Winnipeg, swampy ground (Scoggan, 1951); The Pas, wet mossy and grassy area (Krivda, 1950). First report: Jackson *et al.* [1922].

Temperate amphi-Atlantic: Wash. to Sask. and e. Que., s. to N.D., Mo., Ala., and Pa.; Europe.

### 10. LISTERA R. Br.

### (Twayblade)

1. Lip cleft to below middle into 2 linear prongs and with a pair of horn-like teeth at base; column not more than 0·5 mm. long; rachis glabrous. . . . . . . . . . . . . . . . . . . . 1. *L. cordata*
1. Lip shallowly notched or cleft at most one-third its length; column 2-3 mm. long; rachis glandular-pubescent.

2. Lip not auricled at base, much dilated toward apex; pedicels and ovary glandular..... ........................................................ *L. convallarioides*
2. Lip auricled at base; pedicels and ovary glabrous.
    3. Lip only shallowly notched, the apical sinus broad and open; basal auricles divergent........................................................ 2. *L. borealis*
    3. Lip cleft one-fourth to one-third its length, the sinus narrow; basal auricles incurved-clasping........................................................ *L. auriculata*

1. **L. cordata** (L.) R. Br. Heartleaf Twayblade

Specimens have been seen from only the following localities: Riding Mountain (Rowe, 1948); York Factory, muskeg forest of black spruce and tamarack (Scoggan, 1949). First report: "Lake Winnipeg to the Saskatchewan" [Hooker, 1839].

Subarctic circumpolar: sw. Alaska and south-central Yukon to n. Man., n. Que., central Lab., and Nfld., s. to Oreg., N.M., Minn., and N.C.; southern half of Greenland; Iceland; Eurasia.

2. **L. borealis** Morong Northern Twayblade

Specimens have been seen from the following localities: Lake Winnipegosis, damp places (Macoun, 1881); Gillam, about 165 miles south of Churchill, mossy spruce woods and moist bank of creek (Schofield, 1950); Churchill (Gillett & Tilt, 1948). First report: Raup [1947; map, pl. XX, showing Lake Winnipegosis station, to which should be added the Gillam and Churchill stations].

Subarctic American: central Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, e. Que., and Nfld., s. to s. B.C., Ida., Colo., and south-central Man.

*L. convallarioides* (Sw.) Nutt.: the Lake Winnipegosis citation of Macoun [1888] is referable to *L. borealis*, as are also probably the reports of Bell [1881] and Burman [1910].

*L. auriculata* Wieg.: the Churchill citation of Radforth [1950] is probably referable to *L. borealis.*

### 11. MALAXIS Sw.

### (Adder's-mouth)

1. Pedicels equalling or shorter than the ovaries, the slender raceme 5-8 mm. thick in anthesis; lip drooping, acute, entire; leaf embracing the base of the scape........................................................ 1. *M. monophyllos* var. *brachypoda*
1. Pedicels slender, much longer than the ovaries, the oblong-cylindric raceme 1·3-2·5 cm. thick in anthesis; lip finally ascending, 2-lobed at apex, with a median tooth; leaf embracing middle of scape........................................................ 2. *M. unifolia*

1. **M. monophylla** (L.) Sw. var. **brachypoda** (Gray) Morris & Eames (*M. brachypoda* (Gray) Fern.; *M. monophyllos* of Am. auth., not (L.) Sw.)

Specimens have been seen from the following localities: Treesbank, about 20 miles southeast of Brandon (Fyles, 1914); Grandview, north of Riding Mountain (Rowe, 1950); Lake Winnipegosis, boggy places (Macoun, 1881). First report: "Lake Winnipegoosis", wet woods [Macoun, 1888; as *Microstylis monophyllos*, with *M. brachypoda* listed in synonymy].

(Subarctic-)temperate eastern American: south-central Man. to s. Lab. and Nfld., s. to Colo., Ind., and Pa.; the whole species circumpolar.

2. **M. unifolia** Michx. (*M. ophioglossioides* Muhl.)

A single specimen has been seen from the following locality: Lake Winnipegosis, boggy places (Macoun, 1881). First report: "Winipeg" [Bourgeau, in Palliser, 1863; as *Microstylis ophioglossioides*].

(Subarctic-)temperate eastern American: south-central Man. to e. Que. and Nfld., s. to Tex. and Fla.

### 12. Calopogon R. Br.

1. **C. pulchellus** (Salisb.) R. Br. Grass-pink. Swamp-pink

Specimens have been seen from the following localities: Cedar Lake, near Vivian, about 30 miles east of Winnipeg (Bondar, 1953); about 40 miles east of Winnipeg (Scott, 1925; Simpson, 1939). It is a species of bogs and wet habitats. First report: Winnipeg and N. W. Angle Road [Dawson, 1875]. Basis of the listing of *Limodorum tuberosum* L. by Lowe [1943].

(Subarctic-)temperate eastern American: se. Man. to e. Que. and Nfld., s. to Tex. and Fla. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Fernald [Rhodora 13: 139 (f.), map 7. 1911].

### *Aplectrum* (Nutt.) Torr.

*A. hyemale* (Muhl.) Torr. (*A. spicatum* BSP.) is reported by Hooker [1839] from between Norway House and Cumberland House Fort (Saskatchewan), and is taken up by both Jackson *et al.* [1922] and Lowe [1943]. In the absence of supporting specimens, however, the species must be excluded from our flora for the present.

## 27. SALICACEAE

(Willow Family)

1. Buds with several overlapping scales; floral bracts mostly lacerate; disk below each flower cup-shaped; aments soon arching or pendulous; leaves ovate or deltoid........................ 1. *Populus*
1. Buds with a single scale; floral bracts entire or subentire; disk below each flower consisting of 1 or 2 glands; aments ascending or divergent, rarely drooping; leaves linear to lanceolate, rarely broader except in northern regions........................ 2. *Salix*

### 1. Populus L.

(Poplar. Aspen)

1. Mature leaves heavily white-felted beneath, angulate-lobed; petioles round in cross-section; planted tree, freely escaping........................ 5. *P. alba*
1. Mature leaves glabrous or sparingly pubescent beneath.
    2. Petioles round in cross-section; leaves pale and often russet-streaked beneath; bracts of ament tipped by a fringe of many bristle-like segments.
        3. Leaves glabrous, subcuneate to rounded or subcordate at base....2. *P. balsamifera*
        3. Leaves slightly pubescent on veins beneath, subcordate to cordate at base........................ 2a. *P. balsamifera* var. *subcordata*

2. Petioles flattened toward summit.
  4. Leaves deltoid, acuminate, subtruncate to subcordate at base; bracts of ament with a fringe of many thread-like segments........................3. *P. deltoides*
  4. Leaves ovate to suborbicular; bracts of ament 3-7-cleft.
    5. Leaves 2-8 cm. long, closely and evenly 20-40-toothed on each margin; bracts of ament 3-5-cleft; winter-buds glabrous........................1. *P. tremuloides*
    5. Leaves 4-12 cm. long, irregularly and coarsely 5-15-toothed on each margin; bracts of ament 3-7-cleft; winter-buds ashy-pubescent........4. *P. grandidentata*

1. **P. tremuloides** Michx. Aspen. White Poplar

Woodlands throughout the province except the northeastern barren grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., small grove (Baldwin, 1951). Earliest collection seen: Winnipeg (Lowe, 1917). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg [Dawson, 1875].

Subarctic American: north-central Alaska and Great Bear L. to n. Man., south-central Lab., and Nfld., s. to Calif., N.M., Tenn., and Va. Maps of the greater part of the distribution are given by Munns [1938], Halliday & Brown [1943; showing population intensity], Raup [1947, pl. XX], and the Dominion Forest Service [1949], and of the northern limits by Bell [1882, 1897].

2. **P. balsamifera** L. (*P. tacamahacca* Mill.) Balsam-Poplar

Low woods and shores throughout the province except the northeastern barren grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., small grove at foot of gravel ridge (Baldwin, 1951). Earliest collection seen; Otterburn, south of Winnipeg, along Rat River (Macoun, 1896). First report: Turtle Mountain [Dawson, 1875, p. 289]. Basis of the listing of *P. candicans* by Lowe [1943].

(Arctic-)subarctic American: n. Alaska, Mack. R. Delta, and Coronation Gulf to s. Keewatin, n. Que., n. Lab., and Nfld., s. to Oreg., Nev., Colo., Neb., and Pa. Maps of the greater part of the distribution are given by Munns [1938], Halliday & Brown [1943; showing population intensity], Raup [1947, pl. XXI], and the Dominion Forest Service [1949], and of the northern limits by Bell [1882, 1897].

2a. **P. balsamifera** var. **subcordata** Hylander (var. *michauxii* of auth., not (Dode) Henry) [*See* Rouleau, Rhodora 50: 233-236. 1948; 51: 149-150. 1949]

Known in Manitoba only from Sasaginnigak Lake, about 125 miles northeast of Winnipeg, where it was collected on the sandy shore by Breitung in 1949. First report: the present publication.

Subarctic eastern American: se. Man. to n. Que., s. to Mich. and N.E.

3. **P. deltoides** Marsh. (Incl. *P. sargentii* Dode) Cottonwood

River valleys of southern Manitoba, and commonly planted as windbreaks. Northernmost collection: Vermilion River, north of Riding

Mountain (Tyrrell, 1887). Earliest collection seen: the foregoing Vermilion River specimen. First report: Assiniboine River [Bell, 1882; as *P. monilifera* Ait.].

Temperate American: s. Alta. to s. Que., s. to Ariz., Tex., and Fla. Maps of the northern part of the distribution of *P. deltoides* and *P. sargentii* are given by the Dominion Forest Service [1949].

### 4. **P. grandidentata** Michx. Large-toothed Aspen

A specimen has been seen from Shoal Lake, Sandilands Forest Reserve, near the Ontario boundary, where it was collected by Roberts in 1920. First report: Sandilands [Lowe, 1943].

Temperate eastern American: se. Man. to s. Que., s. to Minn., n. Mo., Tenn., and N.C. A map of the distribution is given by Munns [1938]. Maps of the northern part of the distribution are given by Halliday & Brown [1943; showing population intensity] and the Dominion Forest Service [1949].

### 5. P. ALBA L. White Poplar. Silver-leaved Poplar

A specimen has been seen only from Waskada, west of Turtle Mountain, where it was collected by Dudley in 1928. First report: the present publication.

Eurasian: widely planted and freely escaped in the United States and adjacent Canada.

*P. manitobensis* Dode [Bull. Soc. Dendr. France, No. 38: 30. 1921] is based upon a specimen collected at St. Norbert, near Winnipeg. This specimen has not been seen, but it may be of hybrid origin, or perhaps referable to *P. deltoides* or the following species.

*P. jackii* Sarg.: a specimen from the Assiniboine River valley near Glenboro, about 35 miles southeast of Brandon (Heimburger, 1939) appears referable here. According to Fernald [1950] it is a local hybrid of *P. balsamifera* and *P. deltoides*.

*P. acuminata* Rydb.: the report of this species from Spruce Woods Forest Reserve southeast of Brandon by Shimek [1927] is probably referable to *P. balsamifera*.

## 2. SALIX L.

## (Willow)

[*See* Schneider, 1918, 1919, 1920, 1921; Raup, 1943.]

1. Capsule (and ovary) glabrous.
  2. Trunk and main branches subterranean, the ascending branchlets often less than 10 cm. high, bearing 2-7 shining suborbicular leaves; plant of the far-northern region ........................................................7. *S. herbacea*
  2. Trunk and branches aerial; leaves more numerous; plants taller.
    3. Leaves entire or nearly so.
      4. Styles very short or none; pedicels 2-4 mm. long; bracts yellow; leaves linear-oblong to oblong-obovate; stem slender, creeping and stoloniferous, glabrous........................................20. *S. pedicellaris* var. *hypoglauca*
      4. Styles 1·5-2·5 mm. long; pedicels less than 0·5 mm. long; bracts dark; leaves broadly ovate to suborbicular; stem stout and gnarled, prostrate or ascending, the new internodes densely villous; plant of the Hudson Bay region........................................................16. *S. calcicola*

3. Leaves obviously toothed.

5. Capsules tufted in whorls along the rachis of ament, 4-5 mm. long, lanceolate, on pedicels about 2 mm. long; leaves pale green above, whitened beneath, long-attenuate........................................1. *S. amygdaloides*

5. Capsules spirally arranged.

6. Petioles bearing conspicuous glands on upper surface near base of the strongly reticulate-veined blades.

7. Pistillate aments 1·5-3 cm. long; capsules 7-10(-12) mm. long, opening in late summer or autumn; leaves distinctly whitened beneath..2. *S. serissima*

7. Pistillate aments 2-6(-7) cm. long; capsules 4·5-6·5 mm. long, opening in late spring or early summer.

8. Capsules conic-subulate; pedicels about twice as long as the upper gland; leaves acute to short-acuminate, slightly paler beneath......*S. pentandra*

8. Capsules conic-ovoid; pedicels about four times as long as the upper gland; leaves long-attenuate, scarcely paler beneath................3. *S. lucida*

6. Petioles glandless (or only weakly so in *S. fragilis*).

9. Leaves sessile or nearly so, linear to oblong-lanceolate, remotely sharp-toothed; capsules narrowly lanceolate, 7-10 mm. long, on pedicels 0·5-1·5 mm. long........................................4. *S. interior*

9. Leaves petioled, lanceolate to ovate.

10. Bracts of ament pale, falling before maturing of capsule, the latter 3-5 mm. long.

11. Leaves glabrous; young petioles often viscid at summit; capsules narrowly conic, on pedicels 0·5-1 mm. long..............*S. fragilis*

11. Leaves more or less silvery-silky, at least beneath; young petioles not viscid; capsules ovoid-conic, sessile or subsessile.........*S. alba*

10. Bracts persistent until ripening of capsule.

12. Bracts whitish, thin and elongate; leaves green above, glaucous and finely reticulate beneath, reddish when young; stipules wanting or minute and soon deciduous; capsules 6-8 mm. long, on pedicels 2·5-3·5 mm. long................................15. *S. pyrifolia*

12. Bracts dark.

13. Aments subsessile on naked peduncles, 3-7 cm. long; capsules 6-8 mm. long, on pedicels 1-1·5 mm. long; stipules foliaceous; leaves narrowly to broadly ovate, mostly subcordate at base, glaucous beneath......................14. *S. pseudomonticola*

13. Aments on short leafy-bracted peduncles.

14. Leaves dark green and shining on both sides or only slightly paler green beneath, 2-4(-6) cm. long; stipules small, often wanting; aments 1-3 cm. long.............13. *S. myrtillifolia*

14. Leaves glaucous beneath, mostly 6-12 cm. long; stipules foliaceous; aments 2-6 cm. long.

15. Branches and branchlets yellow, becoming grey, glabrous; leaves yellow-green above...................12. *S. lutea*

15. Branches and branchlets reddish-brown to blackish, finely pubescent or glabrate; leaves dark green above.......... ........................................*S. rigida*

1. Capsule (and ovary) pubescent.

16. Leaves distinctly toothed.

17. Leaves mostly sessile or nearly so, linear to narrowly lanceolate, green both sides, remotely sharp-toothed; pistillate aments 3-6(-8) cm. long, their straw-coloured bracts not persistent in fruit; capsules 7-10 mm. long, their styles nearly obsolete, their pedicels 0·5-1·5 mm. long................................4. *S. interior*

17. Leaves distinctly petioled, more or less glaucous beneath (except *S. maccalliana*, with leaves conspicuously reticulate-veined); bracts brown, persistent; style definite.

18. Aments sessile, bractless, the fruiting ones 2-10(-12) cm. long; capsules 7-12 mm. long, on pedicels 1·5-3 mm. long; styles 0·5-0·7 mm. long; stipules often present on vigorous shoots; leaves mostly elliptic or elliptic-oblanceolate, soon glabrate..........................................24. *S. discolor*

18. Aments on short leafy peduncles; stipules wanting.

19. Leaves green both sides or only slightly paler green on the strongly reticulate-veined lower surface, mostly elliptic-lanceolate; pistillate aments 3-6 cm. long; capsules about 8 mm. long, on pedicels about 1 mm. long ..........................................11. *S. maccalliana*

19. Leaves more or less glaucous beneath, not strongly reticulate-veined, narrowly to rather broadly lanceolate.

20. Capsules 5-7·5 mm. long, on pedicels 0·5-1·25 mm. long; aments up to 6 cm. long; plant of the Hudson Bay and northern regions............................................28. *S. arbusculoides*

20. Capsules 5-9 mm. long, on pedicels 2·5-5 mm. long; aments 1-3·5 cm. long..........................................22. *S. petiolaris*

16. Leaves with entire or indistinctly toothed margin.

21. Plants chiefly of the Hudson Bay and northern regions.

22. Aments sessile and leafless at base or on leafless peduncles.

23. Aments sessile, their bracts dark brown to blackish; pistillate flowers subtended by only 1 gland; styles definite.

24. Leaves glabrous, at least in age, dark green and shining above, glaucous beneath, elliptic-lanceolate to oblong or narrowly obovate; branchlets mostly smooth and shining........................26. *S. planifolia*

24. Leaves pubescent, at least beneath, obovate-lanceolate to obovate; branchlets densely velvety to almost glabrous.

25. Leaves covered beneath with a dense soft white tomentum; plant of the Hudson Bay region.....................17. *S. alaxensis*

25. Leaves more or less pubescent beneath, the pubescence consisting in part of appressed reddish hairs; plant of the low-northern and far-northern regions........................25. *S. scouleriana*

23. Aments on leafless peduncles, their bracts greenish or light brown; pistillate flowers subtended by 2 glands; styles very short or obsolete; leaves broadly obovate to orbicular.

26. Leaves mostly glabrous at maturity, strongly reticulate beneath, on slender petioles up to 2 cm. long or more; capsules 3-4 mm. long; peduncles slender, up to 2·5 cm. long or more........6. *S. reticulata*

26. Leaves more or less densely silky-villous beneath, on petioles less than 1 cm. long; capsules 5-7 mm. long; peduncles stouter, mostly less than 1 cm. long..................................5. *S. vestita*

22. Aments on leafy-bracted peduncles.

27. Branches trailing and rooting, bearing erect aments 3-10 cm. long on peduncles 1-4 cm. long; bracts blackish; leaves glabrous, dark green and shining above, glaucous beneath, elliptic to obovate, their petioles 0·2-5 cm. long or more................................8. *S. arctophila*

27. Branches ascending, not rooting; bracts yellowish to brownish.

28. Leaves ascending and strongly overlapping, on petioles 1-3(-5) mm. long; aments mostly less than 2 cm. long.

29. Leaves white-tomentose beneath; new branchlets densely villous-tomentose..................................10. *S. brachycarpa*

29. Leaves nearly glabrous at maturity; new branchlets smoother... ...........................10a. *S. brachycarpa* var. *antimima*

28. Leaves divergent to loosely ascending, silky-villous to glabrate on both sides, on longer petioles; aments 1-7 cm. long.................... ............................9. *S. cordifolia* var. *callicarpaea*

21. Plants chiefly of the southern and central regions.

30. Aments sessile or subsessile; bracts dark brown to blackish; styles definite.
  31. Leaves dark green and glabrous above, glaucous and glabrous or only sparingly silky beneath.
    32. Aments 2-8(-10) cm. long; bracts dark brown; capsules 7-10(-12) mm. long, on pedicels 1·5-3 mm. long; styles 0·5-0·7 mm. long.................................................24. *S. discolor*
    32. Aments 2·5-6 cm. long; bracts blackish; capsules 6-7 mm. long, on pedicels 0·1-0·5 mm. long; styles 1-1·5 mm. long....26. *S. planifolia*
  31. Leaves puberulent or glabrate above, more or less densely pubescent beneath (or glabrate in age).
    33. Leaves densely silky-pubescent beneath, becoming glabrate in age; aments 2-5 cm. long; capsules 4-6 mm. long, sessile or subsessile; styles 0·8-1·2 mm. long ..........................27. *S. pellita*
    33. Leaves densely grey-pubescent beneath or glabrate in age; pedicels 1-2 mm. long; styles 0·2-0·4 mm. long.
      34. Leaves oblanceolate to narrowly obovate, 3-10(-15) cm. long, the lower surface often glabrate in age; capsules 7-9 mm. long; aments 1·5-3 cm. long...............................23. *S. humilis*
      34. Leaves narrowly oblanceolate, 2-5 cm. long, the lower surface permanently pubescent; capsules 6-7 mm. long; aments 1-1·5(-2) cm. long.......................23a. *S. humilis* var. *microphylla*
30. Aments on leafy-bracted peduncles.
  35. Bracts greenish-yellow with reddish tips; aments 2-7 cm. long; capsules 7-10 mm. long, on pedicels 3-6 mm. long, their styles obsolete or nearly so; leaves more or less grey-pubescent on both sides...........19. *S. bebbiana*
  35. Bracts brown; styles definite.
    36. Leaves dull white-tomentose beneath, their margins revolute; new branchlets densely white-woolly; aments 1-5 cm. long; capsules 6-8 mm. long on pedicels 0·2-0·7 mm. long, their styles 1-1·5 mm. long..........................................................18. *S. candida*
    36. Leaves sparingly pubescent beneath or glabrous in age, their margins non-revolute; styles 0·1-0·4 mm. long.
      37. Leaves linear or lanceolate, acuminate, glabrous beneath (sparingly pubescent when young); branchlets brown or purplish-black, glabrous or glabrate; aments 1-3·5 cm. long; capsules 6-8 mm. long, on pedicels 2·5-5 mm. long......22a. *S. petiolaris* var. *rosmarinoides*
      37. Leaves elliptical or obovate, acute or obtuse, thinly-pubescent beneath (and on the midvein above) or glabrous in age; branchlets finely grey-pubescent; aments 1·5-2 cm. long; capsules 5-6 mm. long, on pedicels 1-1·5 mm. long.............21. *S. athabascensis*

### 1. **S. amygdaloides** Anderss. Peach-leaved Willow

Moist ground and shores of southern Manitoba. Northernmost collection: Lac du Bonnet, about 50 miles northeast of Winnipeg, shore (Scoggan, 1953). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Red River [Andersson, 1867].

Temperate American: se. B.C. to sw. Que., s. to Ariz., Tex., Ky., and Pa. A map of the distribution is given by Munns [1938].

### 2. **S. serissima** (Bailey) Fern. Autumn-Willow

Moist ground and shores in the southern three-quarters of the province. Northernmost collection: York Factory, shore (Scoggan, 1949). Earliest collection seen: Berens River, north of The Narrows, Lake Winnipeg

(Macoun. 1886; determined by Schneider). First report: Berens River and Muskeg Island, Lake Winnipeg [J. M. Macoun, 1906]. Probable basis of the listing of *S. erythrocoma* by Lowe [1943].

Subarctic American: west-central Mack. and Great Slave L. to n. Man., James Bay, and Nfld., s. to Colo., N.D., and Pa.

3. **S. lucida** Muhl. (Incl. var. *angustifolia* Anderss.) Shining Willow

Moist ground and shores in the southern three-quarters of the province. Northernmost collection: York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: Hill River (old name for that part of the Hayes River between Swampy Lake and the confluence of Fox River), in water and very wet places (Bell, 1881; determined by Schneider). First report: Lake Winnipeg [Andersson, Öfv. Svenska Vetensk.—Akad. Förh. 15: 115. 1858].

(Subarctic-)temperate eastern American: n. Man. to s. Lab. and Nfld., s. to S.D., Ill., O., and Del.

*S. pentandra* L. (Bay-leaved Willow): specimens have been seen from the following localities: Oak Lake, 30 miles west of Brandon, "cultivated roadside tree, late flowering" (Ball, 1925); Reston, about 55 miles west-southwest of Brandon, "introduced ornamental tree" (Dudley, 1928). It is not a naturalized element of our flora.

*S. alba* L. (White Willow): specimens have been seen from the following localities: Winnipeg, "tree in hospital park", (Dudley, 1939); Beausejour, about 25 miles northeast of Winnipeg, planted in windbreak row (Scoggan, 1951). It is apparently not naturalized in the province.

*S. fragilis* L. (Crack-Willow): specimens have been seen from the following localities: Boissevain, north of Turtle Mountain, planted along roadside (Scoggan & Baldwin, 1950); Winnipeg, windbreak (Scoggan, 1953); reported also along the railroad between The Pas and Flin Flon [Gardner, 1937]. It is probably not a naturalized element of our flora.

*S. nigra* Marsh. (Black Willow) is reported from Dufferin, Souris River, and Turtle Mountain by Dawson [1875]; from Red River and Assiniboine River by Jackson *et al.* [1922]; and from the Winnipeg area by Lowe [1943]. No specimens have been seen, however, and it is probably not a naturalized element of our flora.

4. **S. interior** Rowlee (*S. longifolia* Muhl.) Sandbar-Willow

Wet ground and shores throughout the southern three-quarters of the province. Northernmost collection: York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Red River and Turtle Mountain [Macoun, 1886]. Most of the Manitoba material is referable to the narrow-leaved (leaves 3-6 mm. wide) var. *pedicellata* (Anderss.) Ball (*S. linearifolia* Rydb.).

Subarctic American: n. Alaska and nw. Mack. to n. Man., James Bay, and e. Que., s. to Wash., Colo., Tex., Ill., and Del.

Forma *wheeleri* (Rowlee) Rouleau, with leaves more or less permanently silvery-silky, has been collected at Winnipeg (Buller, 1918), Grand Beach (Lowe, 1919), prairie sandhills at Lauder and Glenboro (Scoggan, 1951), and on the gravel-cobble beach of Nelson River, about 30 miles east of York Factory (Scoggan, 1949).

5. **S. vestita** Pursh

Specimens have been seen from the following localities: Hayes River at The Rock, about 100 miles southwest of York Factory, white spruce and aspen forest (Scoggan, 1949); Hayes River 20 miles southwest of York Factory, gravel beach (Scoggan, 1949); Nelson River at confluence of Roblin River, about 35 miles west-southwest of York Factory, gravel beach and white spruce forest (Scoggan, 1949); York Factory, white spruce forest (Scoggan, 1949); Churchill (several collections, the earliest seen being that of Macoun in 1910). First report: near York Factory ["H", Richardson, in Franklin, 1823]. A duplicate of the Macoun collection from Churchill, in the Gray Herbarium of Harvard University, was determined by Schneider as var. *erecta* Anderss., but noted as "Difficult to distinguish from typical *vestita*".

(Arctic-)subarctic American: s. B.C. to n. Man., n. Que., n. Lab., and Nfld., s. to Oreg., Mont., and e. Que. A map of the distribution is given by Fernald [1925, map 15, p. 253].

6. **S. reticulata** L.

Specimens have been seen from the following localities: York Factory, muskeg forest of black spruce and tamarack (Scoggan, 1949); Churchill (several collections, the first seen being that of Macoun in 1910). First report: York Factory [Bell, 1881].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (n. to Devon I.), n. Que., and n. Lab., s. to north-central B.C., n. Man., James Bay, and Nfld.; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXI].

7. **S. herbacea** L.

Specimens have been seen from the following localities: Nejanilini Lake, lat. 59° 22′ N., shore (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., silted shore (Baldwin, 1951); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Baralzon and Nejanilini lakes [Scoggan, 1952].

Arctic circumpolar: (gap in western N. Am.); Great Bear L. and n. coast of Mack. and Keewatin to Devon I., n. Lab., and Nfld., s. to n. Man., e. Que., and mts. of N.E.; Greenland; Iceland; n. Eurasia.

8. **S. arctophila** Cockerell

Specimens have been seen from the following localities: Churchill (several collections, the first by Macoun in 1910); Cochrane River, lat. 58° 57′ N., river-bank (Baldwin, 1951); Nejanilini Lake, lat. 59° 22′ N., isolated stand of stunted black spruce and tamarack (Scoggan & Baldwin, 1950); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Churchill [Raup, 1943].

Arctic American: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to s. Ellesmereland), n. Que., n. Lab., and Nfld., s. to Great Bear L., n. Man., James Bay, e. Que., and Mt. Katahdin, Me.; Greenland.

9. **S. cordifolia** Pursh var. **callicarpaea** (Trautv.) Fern. (Incl. var. *macounii* (Rydb.) Schneid.)

Specimens have been seen from the following localities: Nelson River at confluence of Roblin River, about 35 miles west-southwest of York Factory, spruce woods (Scoggan, 1949); York Factory, white spruce woods and muskeg forest of black spruce and tamarack (Scoggan, 1949); Knife Lake, about 120 miles southwest of Churchill (Gillett, 1948); Churchill (several collections, the first by Gardner in 1933). First report: Churchill [Gardner, 1937]. Most or all of the Manitoba material appears to belong to this variety or the scarcely distinct var. *macounii*. Var. *intonsa* Fern., however, with leaves permanently villous, is reported from Churchill by Polunin [1940], and var. *tonsa* Fern., with new branchlets and young leaves nearly or quite glabrous, is reported from Churchill by Ritchie [1956].

Arctic eastern American: coast of ne. Mack. to central Baffin I. and n. Lab., s. to n. Man., James Bay, e. Que., and Nfld.; Greenland; Iceland.

*S. glauca* L. is reported by Størmer [1933] from Churchill, and var. *acutifolia* (Hook.) Schneid. is cited from Churchill by Raup [1943] and from Nueltin Lake by Baldwin [1953]. However, in view of the abundance of material intermediate between this species and the foregoing one in the Hudson Bay region, it is thought best not to include it as a distinct entity of our flora until further studies have been made of more plentiful material. [*See* also Raup, Rhodora 33: 241-244. 1931].

*S. arctica* Pallas, included by Rae [1850] in his list of plants collected between York Factory and Churchill, is probably referable to either *S. brachycarpa* var. *antimima* or *S. cordifolia* var. *callicarpaea*, as may be the citation of a hybrid between *S. arctica* and *S. pulchra* Cham. from Churchill by Gröntved [1936].

10. **S. brachycarpa** Nutt. (Incl. var. *mexiae* Ball)

Specimens have been seen from the following localities: "Plains of Manitoba" (Macoun, 1872; specimen in herbarium of McGill University); York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949); Churchill (several collections, the first by Macoun in 1910; determined by Schneider). First report: Churchill [Schneider, 1918].

Subarctic American: n. Alaska and Great Bear L. to central Keewatin and e. Que., s. to Oreg., Utah. Colo., s. Sask., and James Bay. The large gap between western and eastern areas indicated on the map of Fernald [1925, p. 251, map 5] is now largely filled by numerous collections in the Hudson Bay area.

*S. desertorum* Richards. is reported from Churchill by Ritchie [1956], on the basis of material determined by C. R. Ball. However, in view of the differences of opinion concerning this and related species, it is felt best to exclude it from our flora for the present.

10a. **S. brachycarpa** var. **antimima** (Schneid.) Raup

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, bog (Schofield, 1950); Churchill (several collections, the first by Macoun in 1910; determined by Raup). First report: Churchill [Raup, Rhodora 33: 243. 1931].

Essentially the range of the species.

**11. S. maccalliana** Rowlee

Wet ground, bogs, and shores in the southern three-quarters of the province. Northernmost collection: York Factory, white spruce woods (Scoggan, 1949). Earliest collection seen: Assiniboine River, margins of streams (Macoun, 1879). First report: thickets east of Brandon [Schneider, 1920].

(Subarctic-)temperate American: ne. Alta. to James Bay, s. to s. B.C. and Que.

**12. S. lutea** Nutt.

Dry to moist ground throughout the southern three-quarters of the province. Northernmost collection: York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1874). First report: Raup [1930; map 28, p. 203, showing a station near the north end of Lake Winnipeg]. Probable basis of the citation of a variety of *S. cordata* from Lake Winnipeg by Hooker [1834], and the listing of *S. mackenziana* by Lowe [1943].

(Subarctic-)temperate western American: s. Mack. to n. Man., s. to Calif., Colo., Neb., and Ia.

*S. rigida* Muhl. (*S. cordata* Muhl., not Michx.), the Canadian western limit of which is noted as Ontario by Fernald [1950], but eastern Saskatchewan by Gleason [1952], may occur in Manitoba, but has been accredited to the province almost entirely on the basis of sterile specimens, many of which are referable to *S. lutea*. Further study must be made of fruiting specimens before it can be admitted with certainty to our flora.

*S. cordata* Michx. (*S. adenophylla* Hook.) is reported from Churchill by Gröntved [1936] on the basis of a single sterile specimen. It should be excluded from our flora for the present.

*S. glaucophylla* Bebb (*S. glaucophylloides* Fern. var. *glaucophylla* (Bebb) Schneid.) is reported from Killarney, near Turtle Mountain, by Lowe [1943], but the specimen is apparently not now in existence. A specimen from Winnipeg (Buller, 1918), determined as *S. glaucophylloides* by Ball, with the annotation "A species of James Bay and St. Lawrence River. Must be introduced in Manitoba." is referable to *S. lutea*.

**13. S. myrtillifolia** Anderss.

Wet ground, bogs, and shores almost throughout the province except the extreme north and the southern prairie region. Northernmost collection: Cochrane River, lat. 58° 57′ N., old campsite (Baldwin, 1951). Earliest collection seen: Churchill (Macoun, 1910). First report: York Factory [Bell, 1881; as *S. novae-angliae*]. Probable basis of the citation of "*S. Barclayi* And.?" from Churchill by Gröntved [1936], according to Raup [1943].

Subarctic American: central Alaska, Mack. R. Delta, and Great Bear L. to central Keewatin, n. Que., s. Lab., and Nfld., s. to s. B.C. and e. Que. A map of the distribution is given by Raup [1947, pl. XXI].

*S. uva-ursi* Pursh: the Norway House citation by Lowe [1943] is referable to the foregoing species, according to the undated supplement to Lowe's 1943 checklist. The Churchill and Flin Flon specimens have not been seen, nor has a supporting specimen for the Aweme citation of Criddle [1927]. The species should be excluded from our flora.

14. **S. pseudomonticola** Ball (*S. barclayi* Anderss. var. *pseudomonticola* (Ball) Kelso)

Moist woods and shores in the southern three-quarters of the province. Northernmost collection: Nelson River opposite Gillam Island, 20 miles west-southwest of York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: Brandon, marshy places (Macoun, 1896; determined by Ball). First report: the present publication. An aberrant collection (G. A. Stevenson, No. 915, Brandon, 1954) has staminate and pistillate florets borne in the same aments.

Subarctic American: central Alaska to n. Man. and nw. Que., s. to Mont., n. Wyo., s. Man., and s. Ont.

15. **S. pyrifolia** Anderss. (*S. balsamifera* Barratt) Balsam-Willow

Thickets, borders of woods, and shores throughout the province except the extreme north and the southern prairie region. Northernmost collection: Cochrane River, lat. 58° 13′ N., shore (Baldwin, 1951). Earliest collection seen: Berens River, north of The Narrows, Lake Winnipeg, damp places (Macoun, 1886; determined by Ball). First report: Lake Winnipeg [Andersson, 1867].

(Subarctic-)temperate American: n. B.C. to se. Mack., James Bay, s. Lab., and Nfld., s. to n. Minn. and N.Y.

16. **S. calcicola** Fern. & Wieg. (*S. richardsonii* Hook. var. *macouniana* Bebb) [*See* Fernald & Wiegand, Rhodora 13: 251-253. 1911].

Specimens have been seen from the following localities: York Factory, gravel beach and floodplain of Hay Island (Scoggan, 1949); Churchill (several collections, the first by Macoun in 1910; determined by Floderus). First report: Fernald [1925, p. 323, map 56, noting the Churchill station]. Basis of the citation of *S. richardsonii* from Churchill by Størmer [1933] and between York Factory and Churchill by Rae [1850].

Arctic eastern American: se. Keewatin to central Baffin I., n. Que., and n. Lab., s. to n. Man. and James Bay. Closely related to the northwestern *S. richardsonii*, together with which maps are given by Fernald [1925; 1929]. A map of the distribution of *S. calcicola* is also given by Raup [1943], on which the Churchill station is indicated, but he also notes the Churchill station on a later [1947] map of *S. richardsonii*, presumably including *S. calcicola* in a broad treatment.

17. **S. alaxensis** (Anderss.) Cov.

Known in Manitoba only from Churchill, where it was first collected in 1933 by Gardner. It is a species of barren, exposed habitats. First report: Churchill [Gardner, 1937]. The Churchill plant is probably referable to var. *obovalifolia* Ball; *see* Raup [1943, p. 115 and map, pl. III].

Arctic western American: n. coast of Alaska and Yukon to Banks I. and Melville Pen., s. to s. Alaska, central Alta., and n. Man. A map of the distribution of the collective species, on which its occurrence at Churchill should be indicated, is given by Raup [1947, pl. XXI].

18. **S. candida** Flügge Hoary Willow

Bogs, thickets, and shores throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Brandon, marshy place (Macoun, 1896). First report: north end of Lake Winnipeg [Bell, 1880].

Subarctic American: s. Yukon and Great Bear L. to n. Man., n. Que., Lab., and Nfld., s. to Ida., Colo., S.D., and Pa.

19. **S. bebbiana** Sarg. (*S. rostrata* Richards.; incl. var. *perrostrata* (Rydb.) Schneid.)

Thickets, swamps, and shores throughout the province except the extreme north. Northernmost collection: Churchill (1930, name of collector not stated; determined by Ball). Earliest collection seen: Lake Winnipeg (Richardson, specimen undated but presumably collected during the Franklin expeditions of 1819-22; the earliest dated specimen seen is one collected in the "Lake Winipeg Valley" by Bourgeau in 1857). First report: Burman [1910].

Subarctic American: north-central Alaska and Mack. R. Delta to n. Man., s. Lab., and Nfld., s. to Calif., N.M., Neb., and Pa. A map of the northern part of the distribution is given by Raup [1947, pl. XXI].

20. **S. pedicellaris** Pursh var. **hypoglauca** Fern. (*S. myrtilloides* of Am. auth., not L.)

Wet ground and acid bogs throughout the province except the extreme north. Northernmost collection: Churchill (Gardner, 1930; verified by Raup). Earliest collection seen: Echimamish River, cold peat bogs (Bell, 1880). First reports: Riding Mountain [Lowe, 1943]; Churchill and Echimamish River [Raup, 1943]. Reports of *S. myrtilloides* from Churchill River and Nelson River [Bell, 1880] and from York Factory [Bell, 1881] are referable here. Basis of reports of the main form from the province.

Subarctic American: south-central Yukon and Great Bear L. to s. Keewatin, Lab., and Nfld., s. to Oreg. and N.J.

21. **S. athabascensis** Raup (*S. fallax* Raup) [*See* Raup, Rhodora 32: 111-112. 1930].

Specimens have been seen from the following localities: Sidney, about 40 miles east of Brandon (Macoun & Herriot, 1906; separated by Breitung from a specimen of the superficially very similar *S. pedicellaris* var. *hypoglauca* on the same sheet); Carberry, about 25 miles east of Brandon (Macoun & Herriot, 1906; distributed as *S. hebecarpa* Fern.); Riverton, about 70 miles north of Winnipeg, muskeg forest of black spruce and tamarack (Scoggan, 1951); MacBride River, lat. 56° 50′ N., long. 99° 53′ W., spruce muskeg (J. C. Ritchie, 1955); York Factory, woods, muskeg forest, and clearings (Scoggan, 1949). First report: the present publication.

Subarctic western American: south-central Yukon and Great Bear L. to north-central western Man., s. to south-central Alta. and se. Man. Closely related to, and perhaps finally proving identical with, *S. hebecarpa* Fern. of Mount Albert, Gaspe Peninsula, Que.

22. **S. petiolaris** Sm. (*S. gracilis* Anderss. var. *textoris* Fern.)

Thickets, meadows, and shores in the southern three-quarters of the province. Northernmost collection: MacBride Lake, 56° 52′ N., 99° 57′ W. (Ritchie, 1955). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1874). First report: Lake Winnipeg [Hooker, 1834].

(Subarctic-)temperate American: central B.C. and ne. Alta. to Que. and N.B., s. to Mont., Colo., Neb., and Pa.

22a. **S. petiolaris** var. **rosmarinoides** (Anderss.) Schneid. (var. *angustifolia* Anderss.; *S. gracilis* Anderss.)

Similar habitats in the southern half of the province. Northernmost collection: Norway House, off the northeast end of Lake Winnipeg, swampy shore of island in Little Playgreen Lake (Scoggan, 1948). Earliest collection seen: Portage la Prairie (Macoun & Herriot, 1906). First report: the present publication.

Essentially the range of the species; perhaps the common form in the north.

23. **S. humilis** Marsh. Gray Willow

Thickets, prairie, and rock outcrops in the southern half of the province. Northernmost collection: Flin Flon, granite outcrop (Scoggan, 1951). Earliest collection seen: Berens River, north of The Narrows, Lake Winnipeg, damp places (Macoun, 1886). First report: Carberry, fertile and sandy prairie [Shimek, 1927].

(Subarctic-)temperate eastern American: central Man. to Nfld., s. to e. Tex. and Fla.

23a. **S. humilis** var. **microphylla** (Anderss.) Fern. (*S. tristis* Ait.)

Dry prairie and rock outcrops of southern Manitoba. Northernmost collection: Stonewall, about 15 miles north of Winnipeg, thickets on rocky places (Macoun, 1896; determined by Floderus). Earliest collection seen: the foregoing Stonewall specimen. First report: the present publication.

Temperate eastern American: s. Man. to Me., s. to Neb. and Fla.

24. **S. discolor** Muhl. Pussy Willow

Damp thickets and shores in the southern two-thirds of the province. Northernmost collection: Hayes River at The Rock, about 100 miles southwest of York Factory, wooded clay banks (Scoggan, 1949). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1859). First report: Lake Winnipeg [Hooker, 1834].

(Subarctic-)temperate American: B.C. to n. Man., s. Lab., and Nfld., s. to Mont., S.D., Mo., Ky., and Del.

Var. *overi* Ball, a broad-leaved extreme, is ascribed to Manitoba in the range given by Fernald [1950].

Var. *prinoides* (Pursh) Anderss. is cited from Warren Landing, at the northeast end of Lake Winnipeg, in the undated supplement to Lowe's 1943 checklist, on the basis of a fragmentary and sterile specimen so determined by Ball. According to Schneider [1920], however, it is almost impossible to ascertain what form Pursh had in mind in his original description of *S. prinoides*.

**25. S. scouleriana** Barratt

Specimens have been seen from the following localities: The Pas (Krivda, 1950); Nelson River at High Rock, about 25 miles northeast of Norway House, dry schists (Scoggan, 1948); Flin Flon, granite outcrop (Scoggan, 1951); Reindeer Lake, lat. 57° 37′ N., edge of clearing (Baldwin, 1951). First report: the present publication. Probable basis of the citation by Macoun [1886] of *S. hookeriana* Barratt from the Grand Rapids of the Saskatchewan.

Subarctic western American: sw. Alaska and central Yukon to north-central Manitoba, s. to Calif., N.M., and S.D.

**26. S. planifolia** Pursh (*S. chlorophylla* Anderss. var. *denudata* Anderss.; *S. phylicifolia* of Am. auth., not L.)

Thickets and shores almost throughout the province, except the southern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Churchill (Macoun, 1910). First report: Churchill [Schneider, 1919]. Basis of the report of *S. chlorophylla* Anderss. from Lake Winnipeg by Andersson [1867] and Macoun [1886].

(Arctic-)subarctic American: n. coast of Mack. to s. Baffin I., n. Lab., and Nfld., s. to B.C., e. Que., and N.E. A map of the distribution is given by Raup [1947, pl. XXII].

**27. S. pellita** Anderss.

Specimens have been seen only from the northern half of the province. Northernmost collection: York Factory, gravel beach and floodplain of Hay Island (Scoggan, 1949). Southernmost collection seen: Warren Landing, at the northeast end of Lake Winnipeg (Lowe, 1918; determined by Ball). Earliest collection seen: the foregoing Warren Landing specimen. First report: Lake Winnipeg [Andersson, Mon. Salix, 1865, p. 139; type locality].

(Subarctic-)temperate American: south-central Alta. to n. Man., s. Lab., and Nfld., s. to central Man., n. Mich., and n. N.E.

Forma *psila* Schneid., with leaves glabrescent but white beneath, has been collected by the writer at Hill Lake, north of Lake Winnipeg, and at Oxford Lake, York Factory, and Nelson River opposite Gillam Island.

**28. S. arbusculoides** Anderss.

Specimens have been seen from the following localities: Nelson River at Limestone Rapids, about 150 miles south of Churchill, clearing (Scoggan, 1949); Churchill (several collections, the first by Macoun in 1910; verified by Schneider and Floderus). It is a plant of barren exposed habitats. First report: Churchill [Gröntved, 1936]. Probable basis of the citation of *S. argyrocarpa* f. *serrata* from near Churchill by Størmer [1933; *see* Raup, 1943].

(Arctic-)subarctic western American: n. Alaska and Mack. R. Delta to south-central Keewatin, s. to central B.C., south-central Alta., and n. Man.; perhaps also in Que. A map of the distribution is given by Raup [1947, pl. XXII].

## 28. MYRICACEAE

### (Wax-Myrtle Family)

1. Leaves merely slightly serrate toward apex, cuneate-oblanceolate, without stipules; bracts short, often deciduous, the pistillate aments becoming cone-like.......1. *Myrica*

1. Leaves pinnatifid, linear-lanceolate, with semicordate stipules, fragrant; ovary and fruit overtopped by 8 linear-subulate persistent bracts, the globular pistillate aments bur-like in fruit..........................................................*Comptonia*

### 1. Myrica L.

1. **M. gale** L. Sweet Gale

Wet ground and shallow water throughout the province except the northeastern barren grounds and the southern prairie region. Northernmost collection: Nueltin Lake, lat 59° 48′ N., shore (Baldwin, 1951). Earliest collection seen: Observation Point, opposite Hecla Island, Lake Winnipeg (Macoun, 1884). First report: upper Hill River (old name for that part of the Hayes River between Swampy Lake and the confluence of Fox River) [Preble, 1902].

(Arctic-)subarctic circumpolar: north-central Alaska and Great Bear L. to s. Keewatin, n. Lab., and Nfld., s. to Oreg., Minn., Tenn., and N.C.; Eurasia.

### *Comptonia* L'Hér.

*C. peregrina* (L.) Coult. is reported from southeastern Manitoba by Lowe [1943], and Fernald [1950] includes Manitoba in his range for the species. No specimens have been seen, however, and it must be excluded from our flora for the present.

## 29. BETULACEAE

### (Birch Family)

1. Nuts wingless, enclosed in a foliaceous involucre.
   2. Pistillate flowers 2-4, capitate; involucre leafy, enclosing the acorn-like nut..........................................................1. *Corylus*
   2. Pistillate flowers several in aments; mature involucre inflated and bladdery, enclosing the small achene-like nut..........................................................2. *Ostrya*
1. Nuts mostly winged, without an involucre; pistillate and staminate flowers both in scaly aments.
   3. Fruiting bracts woody and persisting after the fall of the narrow-winged or coriaceous-margined nutlets; pistillate aments racemose; stamens 4....................3. *Alnus*
   3. Fruiting bracts thin and falling with or soon after the mostly broadly-winged nutlets; pistillate aments solitary in the leaf axils; stamens 2......................4. *Betula*

### 1. Corylus L.

### (Hazelnut)

1. Fruiting involucre downy, relatively short, spreading and exposing the top of the bony-shelled nut; staminate aments distinctly peduncled; twigs, petioles, and involucres more or less glandular-bristly..........................................1. *C. americana*

1. Fruiting involucre densely bristly, the bracts fused into a long tubular beak much exceeding the thin-shelled nut; staminate aments sessile or subsessile; twigs, petioles, and involucres essentially glandless..........................................2. *C. cornuta*

1. **C. americana** Walt. American Hazelnut

Thickets and light woods of southern Manitoba. Northernmost collection: Fairford, about 110 miles north of Portage la Prairie, limestone substratum (Scoggan, 1951). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Temperate eastern American: Sask. to Me., s. to Okla., Mo., and Ga.

2. **C. cornuta** Marsh. (*C. rostrata* Ait.) Beaked Hazelnut

Thickets and light woods in the southern half of the province. Northernmost collection: Pipestone Lake, northeast of Lake Winnipeg, rock outcrop (Scoggan, 1948). Earliest collection seen: Winnipeg (Macoun, 1896). First report: Burman [1910].

(Subarctic-)temperate American: s. B.C. to Nfld., s. to Colo. and Ga.

### 2. OSTRYA Scop.

### (Hop-Hornbeam. Ironwood)

1. **O. virginiana** (Mill.) Koch American Hop-Hornbeam

Specimens have been seen from the following localities: Sprague, about 85 miles southeast of Winnipeg (no data apart from locality); Falcon Lake, near the Ontario boundary east of Winnipeg, beach (D. Löve, 1954); Morden, about 60 miles southwest of Winnipeg (Marshall, 1940, moist north exposure of ravine). First report: Burman [1910].

Temperate eastern American: s. Man. to N.S., s. to Tex. and Fla. A map of the northern part of the distribution is given by the Dominion Forest Service [1949], and of the total area by Munns [1938].

### 3. ALNUS B. Ehrh.

### (Alder)

1. Leaves finely and sharply serrate, glutinous, expanding with the flowers; nutlets broadly winged; winter-buds sessile........1. *A. crispa*
1. Leaves rather coarsely doubly serrate, non-glutinous, developed after the inflorescences; nutlets essentially wingless; winter-buds stipitate........2. *A. rugosa* var. *americana*

1. **A. crispa** (Ait.) Pursh (*A. viridis* of Am. auth., not DC.) Green or Mountain-Alder

Open woods, rocky shores, and clearings throughout the province, except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., shore (Scoggan & Baldwin, 1950). Earliest collection seen: Flin Flon (Gardner, 1930). First report: Raup [1947; map, pl. XXII, showing Manitoba stations]. Basis of reports of *A. viridis* from Winnipeg [Bourgeau, in Palliser, 1863] and about 65 miles south of Churchill [Størmer, 1933], and probable basis of the report of *A. glutinosa* from near York Factory ["H", Richardson, in Franklin, 1823].

(Arctic-)subarctic American: n. coast of Alaska and Mack. to s. Keewatin, n. Lab., and Nfld., s. to B.C., Minn., and n. N.E.; sw. Greenland.

2. **A. rugosa** (Du Roi) Spreng. var. **americana** (Regel) Fern. (*A. incana* of Am. auth., not (L.) Moench) Speckled Alder

Similar habitats throughout the province, except the northeastern barren grounds. Northernmost collection: Cochrane River, lat. 58° 13′ N., stony shore (Baldwin, 1951). Earliest collection seen: Macgregor, about 50 miles east of Brandon (Macoun & Herriot, 1906). First report: Hayes River [Scoggan, 1951]; but the basis of numerous earlier reports of *A. incana* from the province, and probable basis of the inclusion of southwestern Manitoba in the map of *A. tenuifolia* given by Raup [1947, pl. XXII].

(Subarctic-)temperate American: Sask. to s. Lab. and Nfld., s. to Ia., W. Va., and Pa.

Var. *americana* forma *hypomalaca* Fern., with leaves densely soft-hairy beneath, was collected by the writer in 1951 on rock outcrops of Whiteshell Forest Reserve, east of Winnipeg.

### 4. BETULA L.

### (Birch)

1. Wings of fruit narrower to rarely as broad as the body; young branchlets and vigorous shoots minutely pubescent, conspicuously dotted with resinous wart-like glands; leaves on short thick petioles; shrubs mostly less than 3 m. high.
   2. Leaves obovate to suborbicular, green on both sides ............... 1. *B. glandulosa*
   2. Leaves cuneate-obovate, distinctly whitened beneath ........................................ 1a. *B. glandulosa* var. *glandulifera*
1. Wings of fruit as broad as or broader than the body; leaves slender-petioled; tall shrubs or trees.
   3. Young branchlets mostly quite devoid of resinous wart-like glands; leaves elliptic-oblong to ovate, tapering or rounded (rarely subcordate) toward base ........................................ 2. *B. papyrifera*
   3. Young branchlets conspicuously resinous-dotted.
      4. Leaves mostly deltoid in outline, truncate to broadly cuneate (rarely subcordate) at base, acute or acuminate toward summit; tall tree, normally with well developed main axis .................................. 2a. *B. papyrifera* var. *humilis*
      4. Leaves ovate, mostly cuneate toward base, the summit acute to obtuse; tall shrub (occasionally 10-12 m. high), often growing in clumps and lacking a main axis ........................................ 3. *B. occidentalis*

1. **B. glandulosa** Michx. Dwarf Birch

Rocky habitats in the far-northern part of the province. The following specimens have been seen: Churchill (several collections, the first by Macoun in 1910); Nejanilini Lake, lat. 59° 22′ N., shore (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., bare knoll (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barren grounds (Scoggan & Baldwin, 1950). First report: near York Factory ["H", Richardson, in Franklin, 1823]; probable basis of the report of *B. nana* L. from between York Factory and Churchill by Rae [1850], which is taken up by Rousseau and Raymond in their map of the area of this species [Rhodora 52:30, map 1. 1950]. Numerous reports of more southerly stations of *B. glandulosa* in Manitoba appear to be almost entirely referable to the following variety.

Arctic American: n. coast of Alaska, Yukon, and Mack. to Victoria I., s. Baffin I., n. Lab., and Nfld., s. to a rather uncertain limit in the northern

U.S.; s. Greenland. A map of the distribution is given by Raup [1947, pl. XXII], from which the station near the south end of Lake Manitoba should probably be deleted.

1a. **B. glandulosa** var. **glandulifera** (Regel) Gl. (*B. pumila* L. var. *glandulifera* Regel)

Rocky ground, prairie slopes, bogs, and shores throughout the southern three-quarters of the province. Northernmost collection: York Factory, muskeg forest of black spruce and tamarack (Scoggan, 1949). Earliest collection seen: Stonewall, north of Winnipeg, open wet prairie (Macoun, 1896). First report: the present publication; basis of earlier reports of the main form and of *B. pumila* L. in southern Manitoba.

Southern part of the range of the main form.

2. **B. papyrifera** Marsh. (*B. alba* of Am. auth., not L.) Paper-Birch. Canoe-Birch

Woods, especially on slopes, almost throughout the province except the extreme north. Northernmost collection: Nejanilini Lake, lat. 59° 22′ N., gravel ridge (Scoggan & Baldwin, 1950). Earliest collection seen: Black River, near the southeast end of Lake Winnipeg (Macoun, 1884). First report: Bell [1882; map showing northern limits]; basis of the earlier report of *B. alba* from Turtle Mountain by Dawson [1875, p. 289].

Subarctic American: Alaska (var. *commutata* (Regel) Fern.) to n. Man., Lab., and Nfld., s. to Wash., S.D., and W. Va. Maps of the greater part of the distribution are given by Halliday & Brown [1943; showing population intensity] and the Dominion Forest Service [1949].

2a. **B. papyrifera** var. **humilis** (Regel) Fern. & Raup (var. *neoalaskana* (Sarg.) Raup; *B. resinifera* Britt.)

Similar habitats almost throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., flank of sandy esker (Baldwin, 1951). Earliest collection seen: Duck Mountain (Heimburger, 1939). First report: [Scoggan, 1950].

(Arctic-)subarctic western American: n. Alaska, Mack. R. Delta, and Great Bear L. to s. Keewatin, s. to n. B.C. and s. Man. A map of the distribution, on which the occurrence of the variety in Manitoba should be indicated, is given by Raup [1947, pl. XXII].

*B. cordifolia* Regel (*B. papyrifera* var. *cordifolia* (Regel) Fern.) is reported from Turtle Mountain by Lowe, but supporting specimens have not been seen. It is an eastern form, and its occurrence in Manitoba is unlikely.

3. **B. occidentalis** Hook. (*B. fontinalis* Sarg.)

Woods, thickets, and shores almost throughout the province. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., bare bouldery knoll (Baldwin, 1950). Earliest collection seen: Macgregor, about 50 miles east of Brandon (Macoun & Herriot, 1906). First report: Virden [Jackson *et al.*, 1922].

Subarctic western American: north-central Alaska, n. Mack., and Great Bear L. to s. Keewatin, s. to Calif., N.M., and Neb. A map of the northern part of the distribution is given by Raup [1947, pl. XXII]. The map given by the Dominion Forest Service [1949] should carry the range much farther north.

×*B. caerulea* Blanchard is cited from Rossburn by Lowe [1943]. No supporting specimen has been seen, nor are there any records of its parents, *B. populifolia* and *B. caerulea-grandis*, in the province.

*B. lenta* L (Cherry-Birch) is reported from Turtle Mountain by Dawson [1875, p. 289], but no supporting specimen of this eastern species has been seen.

*B. pendula* Roth (European Birch) is reported from sand plains of Spruce Woods Forest Reserve and banks of the Souris and Assiniboine rivers by Bird [1927], but no supporting specimens have been seen.

*B. lutea* Michx. f. (Yellow Birch) is reported from the province by Burman [1910], Jackson *et al.* [1922], and Lowe [1943], the probable basis of the inclusion of Manitoba in the range given by Gleason [1952]. The following maps, however, show the species approaching but not entering the southeastern corner of the province: Bell [1882, 1897]; Halliday & Brown [1943, fig. 11]; Dominion Forest Service [1949]. Until specimens are available, the species should be excluded from our flora.

### *Carpinus* L.

### (Hornbeam)

"*Carpinus* (sp. ?)" is cited from "Winipeg" by Bourgeau [in Palliser, 1863]. This report is probably referable to either *Ostrya virginiana* or a species of *Betula*.

## 30. FAGACEAE

## (Beech Family)

### 1. QUERCUS L.

### (Oak)

1. **Q. macrocarpa** Michx. (Incl. *Q. mandanensis* Rydb.) Bur Oak. Mossycup Oak

Common throughout the southern third of the province on prairie slopes, sandhills, rock outcrops, and cleared land. Northernmost collection: Cross Lake (Bell, 1880). This is evidently the Cross Lake northeast of Lake Winnipegosis (not the one northeast of Lake Winnipeg), the northern limit of the species shown by Bell [1882, 1897] bearing in a northwesterly direction from southeastern Manitoba to near the entry of Berens River into Lake Winnipeg, thence around the north end of Lake Winnipegosis. Earliest collection seen: Pine Creek Hills, west of Portage la Prairie, sandy woods (Macoun, 1872). First report: Turtle Mountain [Dawson, 1875]. According to Dawson, probable basis of the report of *Q. obtusiloba* Michx. from Winnipeg by Bourgeau [in Palliser, 1863].

Temperate eastern American: south-central Man. to N.B., s. to Tex., Ala., and N.C. A map of the area is given by Munns [1938], and one of the northern part of the distribution is given by the Dominion Forest Service [1949].

*Q. ellipsoidalis* Hill is reported by Lowe [1943] as occurring along the Minnesota-Manitoba boundary, and Fernald [1950] includes southern Manitoba in his range for the species. No supporting specimens have been seen, however, and the species should be excluded from our flora for the present. Probable basis of the citation of *Q. palustris* Muenchh. from Winnipeg by Gray [in Palliser, 1863, p. 263, based upon Bourgeau's citation of *Q. rubra*, p. 260].

## 31. ULMACEAE

### (Elm Family)

1. Fruit an ovoid, black-purple or dark brown thin-fleshed drupe with a large stone; flowers on shoots of the season, developing mostly with the leaves; leaves singly-serrate, with 2 prominent veins at base in addition to the midrib..........................1. *Celtis*
1. Fruit a thin, flat, broadly-winged, elliptic samara; flowers from special buds of the preceding year, developing before the leaves; leaves doubly-serrate, with many parallel veins from the midrib..............................................2. *Ulmus*

### 1. Celtis L.

1. **C. occidentalis** L. Hackberry. Nettle-tree

Specimens have been seen only from the vicinity of Delta, at the south end of Lake Manitoba, where it was first collected in 1908 (name of collector not given on sheet in National Herbarium of Canada). First report: Delta [Jackson *et al.*, 1922].

Temperate eastern American (incl. var. *pumila* (Pursh) Gray): s. Man. to sw. Que., s. to Okla. and Fla. A map of the area is given by Munns [1938], and one of the northern part of the distribution is given by the Dominion Forest Service [1949].

### 2. Ulmus L.

1. **U. americana** L. American or White Elm

Rich lowlands, especially along streams, in the southern two-fifths of the province. Northernmost collection seen: Steeprock, about 100 miles north of Portage la Prairie, limestone substratum (Scoggan, 1951). The northern limit in the province is given by Stevenson [1938] as running from Bloodvein River, entering Lake Winnipeg near The Narrows, to The Pas. Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1874). First report: Turtle Mountain [Dawson, 1875, p. 289].

Temperate eastern American: east-central Sask. to e. Que. and N.S., s. to Tex. and Fla. Maps of the northern part of the distribution are given by the Dominion Forest Service [1949], and of the northern limits by Bell [1882, 1897]. The map of the area given by Munns [1938] is presumably erroneous as to the Newfoundland locality.

## 32. CANNABINACEAE

(Hemp Family)

### 1. Humulus L.

1. **H. lupulus** L. Common Hop

Thickets and light woods in the southern third of the province. Northernmost collection: Red Deer River, about lat. 53° N. (Hinks, 1939). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Dufferin and Turtle Mountain [Dawson, 1875].

(Subarctic-)temperate circumpolar: B.C. to Nfld., s. to Calif. and N.C. The American plant is sometimes considered a distinct species, *H. americana* Nutt.

## 33. URTICACEAE

(Nettle Family)

1. Leaves opposite; calyx of pistillate flowers of 4 separate or nearly separate sepals; plants with stinging hairs .......... 1. *Urtica*
1. Leaves alternate.
   2. Calyx of pistillate flowers of 4 separate or nearly separate sepals; leaves large, coarsely toothed; plant with stinging hairs .......... 2. *Laportea*
   2. Calyx of pistillate flowers tubular and enclosing the achene; leaves relatively small, entire and undulate; plant unarmed .......... 3. *Parietaria*

### 1. Urtica L.

(Nettle)

1. Leaves elliptic to broadly ovate, deeply incised-serrate; staminate and pistillate flowers mixed in inflorescences mostly shorter than the petioles; soft-stemmed annual .......... 1. *U. urens*
1. Leaves lanceolate to ovate, less deeply serrate; staminate and pistillate flowers chiefly in separate inflorescences longer than the petioles; tough-stemmed perennial .......... 2. *U. dioica* var. *procera*

1. U. urens L. Burning Nettle. Dog-Nettle

The following is the only specimen seen: Portage la Prairie (Macoun & Herriot, 1906). First report: Winnipeg [Lowe, 1943].

Eurasian: widely naturalized in the United States and adjacent parts of Canada.

2. **U. dioica** L. var. **procera** Wedd. (*U. gracilis* Ait.)

Thickets and clearings almost throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the earliest seen being that of Birket-Smith in 1923). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Churchill and Nelson rivers [Bell, 1880]. Basis of the report of *U. dioica* from Riding Mountain by Lowe [1943].

Subarctic American: central Alaska and Great Bear L. to n. Man., interior Lab., and Nfld., s. to Oreg., N.M., Minn., W. Va., and N.E.

### 2. Laportea Gaud.

1. **L. canadensis** (L.) Wedd. (*Urticastrum divaricatum* Ktze.) Wood-Nettle

Damp thickets and rich woods of southern Manitoba. Northernmost collection seen: Selkirk, northeast of Winnipeg, rich woods (Wallace, 1946) (but reported from Riding Mountain by Lowe). Earliest collection seen: Roseau River, south of Winnipeg (Dawson, 1873-74). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to Okla. and Fla.

### 3. Parietaria L.

1. **P. pensylvanica** Muhl. Pellitory

Specimens have been seen from the following localities: Dawson Bay, Lake Winnipegosis, shaded talus below limestone cliffs (Scoggan, 1948); Winkler, about 60 miles southwest of Winnipeg, elm-ash woods (Scoggan, 1953); Rock Lake, northeast of Turtle Mountain, shaded talus below limestone cliffs (Scoggan, 1953). First report: Burman [1910].

(Subarctic-)temperate American: n. B.C. to Man. and sw. Que., s. to Tex. and Fla.; Mexico.

## 34. SANTALACEAE

### (Sandalwood Family)

1. Flowers 2-4 in small cymes from the axils of the middle leaves, only the central one fruit-forming; fruit a red juicy solitary drupe; leaves short-petioled........1. *Geocaulon*

1. Flowers several in terminal corymbs or panicles, all perfect; fruit a dry nut surmounted by the free summit of the calyx; leaves sessile.........................2. *Comandra*

### 1. Geocaulon Fern.

1. **G. lividum** (Richards.) Fern. (*Comandra livida* Richards.) Northern Comandra

Dry or moist woods, rock outcrops, and gravel ridges almost throughout the province, except the southwestern prairie section. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel ridge (Baldwin, 1951). Earliest collection seen: Churchill (Macoun, 1910). First report: Red Deer River, lat. 53° N., and in bogs around Duck and Porcupine mountains [Macoun, 1886].

Subarctic American: north-central Aalska and Great Bear L. to s. Keewatin, south-central Lab., and Nfld., s. to s. B.C., n. Minn., O., and N.E. A map of the greater part of the distribution is given by Raup [1947, pl. XXII].

### 2. Comandra Nutt.

### (Bastard-Toadflax)

1. Calyx-segments 2-3 mm. long; leaves lanceolate to ovate, rather thin, green; fruit subglobose, 3-5 mm. long......................................1. *C. richardsiana*

1. Calyx-segments 3-5 mm. long; leaves linear to narrowly lanceolate, firm, tapering to an acute or somewhat cuspidate apex; fruit ovoid, 6-10 mm. long...........2. *C. pallida*

1. **C. richardsiana** Fern.

Dry prairie slopes and sandhills, light woods, rock outcrops, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Gardner, 1930). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1857-59). First report: Fernald [Rhodora 7: 49. 1905; the foregoing Bourgeau collection].

(Subarctic-)temperate American: B.C. to Nfld., s. to Oreg., Ark., Tenn., and N.Y.

*C. umbellata* (L.) Nutt.: reports of this species from the province are referable to *C. richardsiana*.

2. **C. pallida** A. DC.

Similar habitats in the southern two-fifths of the province. Northernmost collection: Red Deer River, Lake Winnipegosis, black spruce woods (Scoggan & Baldwin, 1950). Earliest collection seen: Fort Garry (Schultz, 1861). First report: prairie near Turtle Mountain [Dawson, 1875].

(Subarctic-)temperate western American: s. Yukon to nw. Sask., s. to Ariz. and Tex.

## 35. LORANTHACEAE

(Mistletoe Family)

### 1. ARCEUTHOBIUM Bieb.

(Mistletoe)

1. Stems 5-10 cm. high, branched; staminate flowers at ends of branches. .1. *A. americanum*
1. Stems 0·5-2 cm. high, simple; all flowers axillary....................2. *A. pusillum*

1. **A. americanum** Nutt. American Mistletoe

Parasitic on *Pinus banksiana*, often causing "witches' brooms". Specimens have been seen from the following localities: Victoria Beach, about 55 miles north-northeast of Winnipeg (several collections, the first by F. W. Broderick in 1925); Cowan, at the northeast base of Duck Mountain (Riley, 1947); Grand Rapids, off the northwest end of Lake Winnipeg (Jackson, 1922 and 1925). First report: Lowe [1943].

Temperate western American: B.C. to south-central Man., s. to Oreg. and Colo.

2. **A. pusillum** Peck (*Razoumofskya pusilla* Ktze.) Dwarf Mistletoe

Parasitic on *Picea* and *Larix*. Specimens have been seen from the following localities: Victoria Beach (Bisby, 1931); near Carberry, sand dunes (A. & D. Löve, 1954); Brandon (1924; name of collector not given); Grand Rapids (Jackson, 1925). First report: Victoria Beach [Jackson *et al.*, 1922].

(Subarctic-)temperate eastern American: south-central Man. to Nfld., s. to Minn. and n. N.J.

## 36. ARISTOLOCHIACEAE

(Birthwort Family)

### 1. Asarum L.

1. **A. canadense** L. (Incl. *A. acuminatum* (Ashe) Bicknell) Wild Ginger

Rich woods of southern Manitoba. Northernmost collection: Lac du Bonnet, about 50 miles northeast of Winnipeg, shaded woods (Breitung, 1949). Earliest collection seen: Pembina Mountain, southwest of Winnipeg (Burgess, 1874). First report: Pembina Mountain [Dawson, 1875]. The Manitoba material appears to be intermediate between the typical form and var. *reflexum* (Bickn.) Robins.

Temperate eastern American: s. Man. to e. Que., s. to Mo., Ky., and N.C.

## 37. POLYGONACEAE

(Buckwheat Family)

1. Inflorescence a twice-forking umbel subtended by 4 or 5 spatulate bracts 1-3 cm. long at the top of the scape, the individual umbellets subtended by a top-shaped involucre enclosing the pedicels of the small yellow florets; leaves without stipules; stem very short and thick, woody, simple or branching; plant densely white-tomentose, the upper surface of leaves and bracts greenish in age; dry prairie slopes.................1. *Eriogonum*
1. Inflorescence racemose or paniculate, the florets not subtended by an involucre; stems leafy, the leaves with sheathing stipules (ocreae).
    2. Calyx 6-parted, the inner sepals mostly much enlarged in fruit (then called "valves"), the valves veiny and often with a grain-like tubercle, their margins entire, dentate, or bristle-fringed; outer valves often spreading in fruit; achenes 3-angled...2. *Rumex*
    2. Calyx mostly 5-parted, the mature sepals equally enlarged, sometimes wing-angled but not valve-like.
        3. Leaves triangular-hastate, on an erect, non-twining stem; flowers white; achenes 3-angled, exserted or but loosely embraced by the soon shrivelling calyx..........................................................................3. *Fagopyrum*
        3. Leaves tapering to rounded or cordate at base, if triangular-hastate the stem climbing by prickles or usually twining; flowers of various colours; achenes lenticular or 3-angled, closely embraced by the calyx-segments.............4. *Polygonum*

### 1. Eriogonum Michx.

1. **E. flavum** Nutt.

Specimens have been seen from the following localities: Souris Plain, gravelly slopes (Macoun, 1884); Copley, west of Turtle Mountain (Jackson, 1921); Melita, about 60 miles southwest of Brandon, sandy prairie (Scoggan, 1953); Oak Lake, about 30 miles west of Brandon, denuded prairie slope above Assiniboine River (Scoggan, 1953); Miniota, about 50 miles west-northwest of Brandon, denuded prairie slope above Assiniboine River (Scoggan, 1953); St. Lazare, about 75 miles northwest of Brandon, dry prairie slopes (Macoun, 1879; Macoun & Herriot, 1906; Scoggan, 1951). First report: Burman [1910].

Temperate western American: s. B.C. to s. Man., s. to Colo. and Neb.

## 2. Rumex L.

### (Dock. Sorrel)

[*See* Rechinger, 1937.]

1. Leaves (at least the lower cauline and basal ones) sagittate or hastate, acid-tasting; flowers dioecious.

2. Leaves hastate, the basal lobes wide-spreading; sepals not obviously enlarged in fruit; plant spreading by slender running rootstocks....................1. *R. acetosella*

2. Leaves sagittate, the basal lobes directed backward; sepals enlarged in fruit, thin and veiny; plant tufted from a tap-root, without slender rootstocks.........2. *R. acetosa*

1. Leaves neither sagittate nor hastate, tapering to rounded or cordate at base, scarcely acid; flowers mostly perfect.

3. Stem ascending to decumbent at base, producing axillary branches or leaf-tufts.

4. Valves 2 cm. or more broad, grainless, roseate, cordate-reniform; ocreae conspicuous, dilated upward; stem from a long creeping rootstock..........3. *R. venosus*

4. Valves 3-5 mm. broad, 1 or more of them grain-bearing; ocreae close, cylindric; tap-root vertical.

5. Valves all grain-bearing..................................4. *R. mexicanus*

5. None of the valves grain-bearing..........................5. *R. utahensis*

3. Stems usually erect, without axillary shoots.

6. Valves entire or merely slightly toothed.

7. Grains of the fruiting calyx none or only 1 on one of the valves.

8. Leaves with strongly wavy-curled margins, mostly less than 5 cm. wide, tapering to obscurely cordate at base; mature valves 4-6 mm. long; achenes 1·5-2·5 mm. long............................................6. *R. crispus*

8. Leaves flat, the principal ones rounded to truncate or cordate at base.

9. One of the valves grain-bearing, 6-8·5 mm. long; achenes 2·8-3·5 mm. long; lower leaves broadly cordate-lanceolate, 7-18 cm. broad.....7. *R. patientia*

9. None of the valves grain-bearing, the valves 4-5 mm. long.

10. Nerves of the valves thickish but indistinct; achenes about 2 mm. long; principal leaves narrowly rounded to truncate at base, 6-12 cm. long, 2-3 cm. broad; stem 1-4 dm. high; plant of the Hudson Bay region..... .................................................*R. arcticus*

10. Nerves of the valves fine but distinct; achenes 2-3 mm. long; principal leaves rounded to cordate at base, 5-20 cm. or more broad; stem up to 2 m. high.......................................8. *R. occidentalis*

7. Grains of the fruiting calyx 3, one to each valve.

11. Leaves with strongly wavy-curled margins, mostly less than 5 cm. wide, the lower ones truncate or obscurely cordate at base, the veins oblique, soon branching; valves round-cordate, the grains rounded at apex; pedicels conspicuously jointed.........................................6. *R. crispus*

11. Leaves flat, 5-10 cm. wide, rather acute at both ends, the veins nearly at right-angles to the midrib and distinct for about half-way to the margin; valves suborbicular, obscurely cordate at base, rounded at apex, the grains narrowed to a subacute apex; pedicels obscurely jointed....9. *R. orbiculatus*

6. Valves with marginal bristles longer than breadth of valve; grains 3, linear-lanceolate; lower leaves truncate to cordate at base; stems soft and hollow....... ..........................................10. *R. maritimus* var. *fueginus*

1. R. acetosella L. Sheep-Sorrel

Specimens have been seen from the following localities: Sandilands Forest Reserve southeast of Winnipeg, sandy jack-pine woods (Scoggan, 1951); Winnipeg (Groh, 1922); Birds Hill, near Winnipeg (Denike, 1940); Gregg, northeast of Brandon (Olmstead, 1948); The Pas (Krivda, 1950);

Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, garden (Scoggan, 1949); Flin Flon (Sparling, 1937). First report: Jackson *et al.* [1922].

European: widely introduced in North America, north to Alaska and Yukon.

2. R. ACETOSA L. Garden-Sorrel

Known in Manitoba only from Morden, about 60 miles southwest of Winnipeg, where it was collected in waste places by Groh in 1932. First report: Morden [Groh, 1946].

European: widely introduced in the northeastern United States, and in Canada from Alaska to Newfoundland.

3. **R. venosus** Pursh

Specimens have been seen from the following localities: Aweme, about 20 miles southeast of Brandon (Fletcher, 1904; Criddle, 1926; Lowe, 1935, sandhills); Carberry, about 25 miles east of Brandon (Rand, 1937); Morris, about 35 miles south of Winnipeg (Sparling, 1937); Fisher Branch, about 80 miles north of Winnipeg (McInnis, 1925). It is a species of sandy open habitats. First reports: near Aweme [Criddle, 1927]; Spruce Woods Forest Reserve near Treesbank, about 20 miles southeast of Brandon [Bird, 1927].

Temperate western American: Sask. to s. Man., s. to Calif. and Tex.; introduced in Wisc.

4. **R. mexicanus** Meisn. (Incl. *R. triangulivalvis* (Danser) Rech. f.)

Moist ground and shores throughout the province except the extreme north: Northernmost collection: Churchill (Beckett, 1953). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Warren Landing [Lowe, 1920]. Basis of earlier reports of *R. salicifolius* Weinm. from Manitoba.

(Subarctic-)temperate American: s. Alaska to n. Man. and Nfld., s. to Calif., Tex., Mo., O., and N.B.

*R. pallidus* Bigel., differing from the foregoing species in having the margin of the valve on both sides of the "grain" narrower than the grain, may be represented by a specimen from Norway House (Scoggan, No. 3186, 1948), but further collections are necessary before it can be established as a distinct member of our flora.

5. **R. utahensis** Rech. f.

A specimen has been seen only from Grand Rapids, off the northwest end of Lake Winnipeg, where it was collected on the limestone-cobble beach by the writer in 1948. The specimen was determined by N. Sarkar. First report: the present publication.

Subarctic western American: central Yukon to south-central Man., s. to Oreg., Nev., Utah, and Colo.; probably introduced at the above locality.

6. R. CRISPUS L. Yellow Dock

Moist ground and waste places in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railroad yard (Schofield, 1950). Earliest collection seen: Brandon, ditch (Macoun, 1896). First report: "westward to Manitoba" [Macoun 1896].

European: widely naturalized in North America.

7. R. PATIENTIA L. Patience-Dock

Specimens have been seen from the following localities: Morris, about 35 miles south of Winnipeg (Sparling, 1939); Ethelbert, east of Duck Mountain, roadside 10 miles south of town (Scoggan, 1953). First report: Morris [Lowe, 1943].

Eurasian: widely naturalized throughout the United States and adjacent parts of Canada.

8. **R. occidentalis** Wats. (Incl. *R. fenestratus* Greene)

Moist or wet ground and shores throughout the province except the extreme north. Northernmost collection: Cochrane River, lat. 58° 57′ N., old camp-site (Baldwin, 1951). Earliest collection seen: Churchill (Bell, 1884). First report: "Shore of Hudson's Bay at York Factory and Fort Churchill" [Bell, 1884].

Subarctic American: sw. Alaska and central Yukon to n. Man., s. Lab., and Nfld., s. to Calif., Tex., Man., and Me.

*R. arcticus* Trautv.: a specimen from Churchill in the National Herbarium of Canada may be referable to this species (Porsild, No. 5431, July 3-5, 1930), but further collections are necessary before it can be accredited to our flora with certainty.

9. **R. orbiculatus** Gray (*R. britannica* of Am. auth., not L.) Water-Dock

Specimens have been seen from the following localities: Steinbach, about 30 miles southeast of Winnipeg, gravelly roadside (Scoggan, 1953); Winnipeg (Malte, 1917); Bissett, about lat. 51° N. near the Ontario boundary (Marck, 1935); Norway House, off the northeast end of Lake Winnipeg, wooded shore (Scoggan, 1948); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, slough (Scoggan, 1949). First report: York Factory [Bell, 1881]. This northern citation should be verified.

(Subarctic-)temperate eastern American: Man. to Nfld., s. to Neb. and Pa..

10. **R. maritimus** L. var. **fueginus** (Philippi) Dusén. Golden Dock

Wet ground and shores almost throughout the province except the extreme north. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: "Point du Chien, Man.", borders of marshes and lakes (Macoun, 1872). First report: Swan Lake [Groh, 1946]. Basis of reports of the main form by Burman [1910] and of *R. persicarioides* by Jackson *et al.* [1922] and Lowe [1943]. According to Gleason [1952], scarcely separable from the main form.

Subarctic American: se. Alaska and central Yukon to n. Man. and Anticosti I., Que., s. to Calif., N.M., Ark., Ill. and N.Y.

## 3. Fagopyrum Mill.

(Buckwheat)

1. Flowers white, 2-3 mm. long, in clustered terminal racemes; achenes smooth and shining ................................................ 1. *F. sagittatum*
1. Flowers greenish, 1-2 mm. long, in scattered, elongate, loose racemes; achenes dull and roughish, the sides furrowed ........................................ 2. *F. tataricum*

1. F. sagittatum Gilib. (*F. esculentum* Moench) Buckwheat

Cultivated and commonly escaped. The following specimens have been seen: Winnipeg (Marquardt, undated); Morden, about 60 miles southwest of Winnipeg, roadside, escaped from adjoining field (Scoggan, 1953). First report: the present publication.

Asiatic: spreading from cultivation in North America.

2. F. tataricum (L.) Gaertn. India-wheat

The following specimen has been seen: Victoria Beach, about 55 miles north-northeast of Winnipeg, sandy open ground (Neatby, 1929). First report: the present publication.

Asiatic: spreading from cultivation in North America.

## 4. Polygonum L.

(Knotweed. Smartweed)

1. Leaves sagittate, hastate, or cordate; stems climbing by prickles or twining (sometimes trailing).
  2. Stem weak, reclining and climbing by stout reflexed prickles on its 4 angles; flowers pink to white, in small heads .................................. 1. *P. sagittatum*
  2. Stem stronger, usually twining, without prickles; flowers paniculate.
    3. Ocreae (sheaths) with a ring of reflexed bristles at base; mature calyx wingless; achenes lustrous; leaves pilose beneath .......................... 2. *P. cilinode*
    3. Ocreae beardless at base; leaves glabrous, often scabrous on the veins beneath.
      4. Outer sepals merely keeled; achenes dull and granular; flowers short-pedicelled; basal lobes of leaves acute ........................ 3. *P. convolvulus*
      4. Outer sepals winged in fruit, the wings thin and scarious, yellowish-brown to roseate, 1·5-3 mm. broad at summit; achenes smooth and shining; flowers long-pedicelled; basal lobes of leaves rounded ..................... 4. *P. scandens*
1. Leaves tapering at both ends, or at most rounded to subcordate at base..
  5. Flowers in terminal, dense to loose, spike-like racemes; leaves not jointed to petioles; ocreae mostly firm, rarely lacerate.
    6. Stem from a short, thick, erect rhizome; long-petioled basal leaves present in addition to the stem-leaves; spike solitary, narrow, 2-10 cm. long, bearing a number of dark-coloured bulblets at its lower end; plant of the Hudson Bay and northern regions .................................................. 5. *P. viviparum*
    6. Stem from fibrous roots or slender stolons and rhizomes, leafy above the base; spikes terminating main axis and branches, without bulblets.
      7. Ocreae bristly-ciliate at summit; peduncles glabrous or nearly so.
        8. Summit of ocreae expanded into a horizontally divergent herbaceous flange; spikes 1-4, 1-4 cm. long; perennial by slender and tough forking rhizomes.... ........................................ 6. *P. amphibium* var. *stipulaceum*
        8. Summit of ocreae without spreading flange.

9. Mature calyx glandular-punctate; spikes slender, arching, usually much interrupted at base, the lower flowers often in the axils of leaves.

10. Calyx greenish or red-tipped; achenes dull, punctate-striate........................................................11. *P. hydropiper*

10. Calyx greenish below, with white (rarely roseate) sepals; achenes lustrous ..................................8. *P. punctatum* var. *confertiflorum*

9. Mature calyx not dotted; spikes dense, oblong-cylindric, 7-11 mm. thick; calyx greenish-pink to purplish, the mature sepals with prominently reticulate bases; achenes lustrous; leaves often purplish-blotched above..........................................................9. *P. persicaria*

7. Ocreae nearly or quite without marginal cilia, not flanged; spikes dense.

11. Peduncles glabrous or nearly so.

12. Spikes 1-4, erect, thick-cylindric or ovoid, 1-4 cm. long; achenes lenticular; leaves floating or submersed, or prostrate on mud, rather abruptly rounded to long petioles; perennial by slender and tough forking rhizomes; (f. *fluitans*)..............................6. *P. amphibium* var. *stipulaceum*

12. Spikes few to many, slenderly cylindric, 1-8 cm. long; achenes flattened, with 1 side concave; leaves aerial, often glandular-punctate, gradually tapering to short petioles; annual with fibrous roots.

13. Leaves green except for sessile glands beneath, up to 25 cm. long; spikes 1-8 cm. long, the longer ones arching to pendulous; stem often much branched, up to 25 dm. high..............10. *P. lapathifolium*

13. Leaves white-pubescent beneath, up to 10 cm. long; spikes 1-few, erect, 1-3·5 cm. long; stem slender, simple to slightly branched, up to 6 dm. high..........................10a. *P. lapathifolium* var. *salicifolium*

11. Peduncles pubescent or sparsely to copiously glandular, or both.

14. Spikes 1-3, usually 4-18 cm. long; plant perennial from stout creeping rhizomes.

15. Petioles attached near base of ocreae; leaves and upper part of stem glabrous or sparsely strigose......................7. *P. coccineum*

15. Petioles mostly attached midway on the ocreae; leaves and upper part of stem densely canescent-pubescent.......................................................7a. *P. coccineum* var. *pratincola*

14. Spikes few to many; leaves gradually tapering to apex; annuals with fibrous roots.

16. Peduncles and axis of inflorescence with obvious stalked glands; spikes erect, 1-5 cm. long, 1-1·5 cm. thick...............*P. pensylvanicum*

16. Peduncles with sparse sessile glands; spikes 1-8 cm. long, 5-9 mm. thick, the longer ones arching to pendulous.

17. Leaves green; other characters as before......10. *P. lapathifolium*

17. Leaves white-pubescent beneath; other characters as before...............................10a. *P. lapathifolium* var. *salicifolium*

5. Flowers in clusters in the leaf-axils, or sometimes subtended by short bracts in a slender terminal spike; leaves jointed upon very short petioles; summit of ocreae finally 2-lobed or lacerate.

18. Flowers solitary or in pairs, soon reflexed, mostly subtended by short bracts in a slender terminal partially naked spike; achenes not exserted; stem and branches sharply angled, erect......................................12. *P. douglasii*

18. Flowers not reflexed, in axillary clusters, much overtopped by the subtending leaves; stem round or nearly so in cross-section, often striate, prostrate or ascending.

19. Achenes highly lustrous, included within the calyx or exserted at maturity; mature pedicels exserted above the ocreae; leaves acutish at each end; plants yellowish-green, erect.

20. Sepals yellowish-green with yellow margins; achenes dark brown, 2·2-3·5 mm. long, or some later ones prolonged to 4 mm. and exserted.....................................................13. *P. ramosissimum*

20. Sepals with white or pinkish margins; achenes chestnut-brown, 2-3 mm. long, or some later ones prolonged to 6 mm. and exserted....14. *P. interior*

19. Achenes dull or sublustrous.

21. Stem flexible, prostrate to loosely ascending, scarcely ridged; leaves obovate to spatulate, their petioles much exceeding the subtending ocreae; sepals with white to pink margins; achenes 3·5-4 mm. long; plant of the Hudson Bay region........................................15. *P. boreale*
21. Stem firm, ridged or corrugated; leaves sessile or nearly so; achenes 2-3 mm. long.
    22. Mature pedicels exserted from the fibrous-lacerate ocreae; achenes brown, included; leaves elliptic, blunt, they and the margins of the sepals yellowish-green; stem erect or ascending..:.....16. *P. erectum*
    22. Mature pedicels all or mostly included within the ocreae; leaves blue-green.
        23. Fruiting calyx 3·4-4 mm. long, strongly constricted below the beak-like tip; inner sepals white-margined; achenes olivaceous; leaves crowded, elliptic to obovate, rounded at summit; ocreae non-fibrous, persistent; stem erect or decumbent-ascending.....17. *P. achoreum*
        23. Fruiting calyx 2-3 mm. long, not constricted; sepals pink to purple; achenes dark brown; leaves scattered, linear to oblong or elliptic, acute or blunt; ocreae soon fibrous-lacerate; stem prostrate to loosely ascending or erect............................18. *P. aviculare*

1. **P. sagittatum** L. (*Tracaulon sagittatum* (L.) Small) Arrow-leaved Tearthumb

Specimens have been seen from the following localities: Shoal Lake, on the Ontario boundary east of Winnipeg (Scott, 1920); Brereton Lake, Whiteshell Forest Reserve east of Winnipeg (Sparling, 1938); Bloodvein River, near The Narrows, Lake Winnipeg, bogs (Macoun, 1884). It is a species of low, moist ground. First report: Winnipeg [Jackson *et al.*, 1922].

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Tex. and Fla.; reported from Saskatchewan.

2. **P. cilinode** Michx. (*Bilderdykia cilinodis* (Michx.) Greene)

Rock outcrops and clearings in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, roadside (Scoggan, 1949). Earliest collection seen: Red Deer Lake, lat. 53° N. (Macoun, 1881). First report: "Winnipeg and N. W. Angle Rd." [Dawson, 1875].

(Subarctic-)temperate American: north-central Sask. to Nfld., s. to Minn. and Pa.

3. P. CONVOLVULUS L. (*Bilderdykia convolvulus* (L.) Dum.) Black Bindweed

Clearings and thickets throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: Dawson Road, Man., thicket (Dawson, 1873). First report: "It has already become a vile weed in Manitoba" [Macoun, 1886].

European: widely naturalized in North America.

4. **P. scandens** L. Climbing False Buckwheat

Specimens have been seen from the following localities: Matlock Beach on the southwest end of Lake Winnipeg (Marquardt, 1931); Shoal Lake, on the Ontario boundary east of Winnipeg (Lowe, 1920); Rathwell, about 20 miles southwest of Portage la Prairie, woods (de Ruyck, 1944); Brokenhead, about 30 miles northeast of Winnipeg (A. & D. Löve, 1952). Cited also from Spruce Woods Forest Reserve by Shimek [1927]. It is a species chiefly of damp thickets, shores, and clearings. First report: Turtle Mountain, Winnipeg, and North-West Angle Road [Macoun, 1886]. Basis of early reports of *P. dumetorum* from the province.

Temperate eastern American: s. Man. to N.S., s. to Tex. and Fla.

5. **P. viviparum** L. Bistort

Marshy ground, muskeg forest, shores, and tundra in the northern two-fifths of the province. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Southernmost collection: Hayes River near Swampy Lake, about 130 miles southwest of York Factory, wooded shore (Scoggan, 1949). Earliest collection seen: Churchill (McTavish, 1854). First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to northernmost Ellesmereland), n. Que., n. Lab., and Nfld., s. to Minn. and N.E., and in the western mountains to N.M.; circumgreenlandic (with gaps); Iceland; Spitsbergen; n. Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XXIII].

6. **P. amphibium** L. var. **stipulaceum** (Coleman) Fern. (var. *hartwrightii* (Gray) Bissell; ssp. *laevimarginatum* Hult.; *P. natans* f. *hartwrightii* (Gray) Stanford) [*See* Bissell, Rhodora 4: 104-105. 1902; Stanford, Rhodora 27: 109-112, 125-130, 146-152, 156-166. 1925; Fernald, Rhodora 48: 49-53. 1946; Hultén, 1944, pp. 612-613]. Water-Smartweed

Wet ground, shores, and clearings throughout the province except the extreme north. Northernmost collection: Cochrane River, lat. 57° 58′ N., wet river bank (Baldwin, 1951). Earliest collection seen: York Factory (Bell, 1880). First report: York Factory [Macoun, 1886; as *P. hartwrightii* Gray]. Basis of reports of the main form from the province.

Subarctic American: nw. Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, and Nfld., s. to Utah, Colo., Neb., and Pa.

Var. *stipulaceum* forma *fluitans* (Eat.) Fern. (*P. fluitans* Eat.), the aquatic extreme, has been found throughout the province as far north as Nueltin Lake, lat. 59° 43′ N. (Baldwin, 1951, sheltered bay). The earliest citation is that of Dawson [1875; as *P. amphibium* var. *aquaticum*], "Winnipeg and N.W. Angle Rd."

Var. *stipulaceum* forma *hirtuosum* (Farw.) Fern., with leaves and upper part of stem densely villous or hirsute, has been found throughout the province as far north as Churchill (Gillett, 1948).

7. **P. coccineum** Muhl. (*P. muhlenbergii* (Meisn.) Wats.; *P. emersum* (Michx.) Britt.)

Wet ground and shallow water in the southern half of the province. Northernmost collection: The Pas, in the Saskatchewan River (Krivda, 1954). Earliest collection seen: High Bluff, near Portage la Prairie (Hargrave, 1883). First report: Souris River [J. M. Macoun, 1894].

Temperate American: B.C. to N.S., s. to Calif., Tex., Ky., and N.C.

Var. *rigidulum* (Sheldon) Stanford, the aquatic extreme with glabrous to only sparsely pubescent floating leaves and branches, is accredited to Manitoba by Fassett [1940].

7a. **P. coccineum** var. **pratincola** (Greene) Stanford

Wet ground to sandy prairie habitats in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, rocky island (Scoggan, 1948). Earliest collection seen: Fort Garry (Schultz, 1860). First report: the present publication.

Temperate American: Man. to Ind., s. to Tex., Okla., and Ark.; Mexico.

8. **P. punctatum** Ell. var. **confertiflorum** (Meisn.) Fassett Water-Smartweed

Specimens have been seen from the following localities: Winnipeg (Malte, 1917); Stonewall, near Winnipeg (Denike, 1942); Seven Sisters Falls, about 50 miles northeast of Winnipeg (Quelch, 1950). It is a species of wet habitats. First report: Piney Island, Lake Winnipeg [Fassett, Brittonia 6: 377. 1948]. Basis of reports of the main form from the province.

Temperate American: s. B.C. to N.S., s. to Oreg., Colo., Ark., Tenn., and Ga.; Mexico. A map of the distribution is given by Fassett [Brittonia 6: 377. 1948, fig. 16].

9. P. PERSICARIA L. Lady's-thumb

Shores and waste land of southern Manitoba. Northernmost collection: Riverton, about 70 miles north of Winnipeg, marshy shore (Scoggan, 1951). Earliest collection seen: Brandon, ditch (Macoun, 1896). First report: "Manitoba" [Macoun, 1886].

European: widely naturalized in temperate North America.

10. **P. lapathifolium** L. (*P. nodosum* Pers.) [*See* Fernald, Rhodora 23: 258-259. 1921]

Marshes, shores, rock outcrops, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: Brandon, ditch (Macoun, 1896). First report: shore of Muskeg Island, Lake Winnipeg [Macoun, 1886; as *P. nodosum*].

(Subarctic-)temperate circumpolar: B.C. to Nfld., s. throughout most of the U.S.; Eurasia.

10a. **P. lapathifolium** var. **salicifolium** Sibth. (var. *incanum* (Willd.) Koch; *P. tomentosum* var. *incanum* Robins. & Fern.)

Similar habitats and distribution in the province. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., lakeshore at old campsite (Baldwin, 1951). Earliest collection seen: Muskeg Island, Lake Winnipeg, low ground (Macoun, 1884). First report: Burman [1910]. Considered a good variety by many authors, although Fassett [1940] believes it may be merely a juvenile state of the typical form.

Range of the species.

11. **P. hydropiper** L. (Incl. var. *projectum* Stanford) Common Smartweed

Specimens have been seen from the following localities: Red River, near Winnipeg (Denike, 1940); Washow Bay, Lake Winnipeg, low ground (Macoun, 1884). First report: Flin Flon [Lowe, 1943].

(Subarctic-)temperate circumpolar: B.C. to Nfld., s. throughout most of the U.S.; introduced in Alaska; Eurasia.

*P. pensylvanicum* L. (Pinkweed): a specimen in the Gray Herbarium of Harvard University (Clear Lake, Riding Mountain, E. Scamman, No. 3878, 1941) appears referable here, but further collections should be made before it is admitted to our flora.

12. **P. douglasii** Greene

Dry soil and rock outcrops of southern Manitoba. Northernmost collection: Sasaginnigak Lake, about 125 miles northeast of Winnipeg, granite rocks (Breitung, 1949). Earliest collection seen: Carberry Plains (Fletcher, 1896). First report: Carberry Plains [Groh & Frankton, 1949]. Basis of reports of *P. tenue* Michx. from the province.

Temperate American: B.C. to Que., s. to Calif., N.M., Minn., and N.Y.

13. **P. ramosissimum** Michx. Bushy Knotweed

Moist ground, shores, and clearings in the southern half of the province. Northernmost collection: The Pas, gravel roadside (Krivda, 1949). Earliest collection seen: Winnipeg (Macoun, 1872). First report: Rat Creek, south of Winnipeg [J. M. Macoun, 1894; but the specimen involved is referable to the following species].

Temperate American: B.C. to Que., s. to N.M., Tex., Ill., and Pa.

14. **P. interior** Brenckle, Phytologia 2: 403. 1948. (Incl. var. *turneri* Brenckle)

Prairie, shores, and waste places of southern Manitoba. Northernmost collection: Delta, south end of Lake Manitoba, salt marsh (Löve, 1951). Earliest collection seen: Rat Creek, south of Winnipeg, sandy shores and banks of streams (Macoun, 1872). First report: the present publication.

Temperate western American: thus far, known only from Alta., Sask., Man., and S.D.

15. **P. boreale** (Lange) Small

Known in the province only from Churchill, where it was collected by Gillett in 1948 in a "cinder area" and in "fine wet gravel at tide mark on beach". The specimens were determined by Breitung. First report: the present publication. Possible basis of the report of *P. fowleri* from Churchill by Størmer [1933].

Subarctic amphi-Atlantic: shores of Hudson Bay and James Bay; e. Que., Lab., and n. Nfld.; s. Greenland; n. Europe.

16. **P. erectum** L.

Wet ground and waste places of southern Manitoba. Northernmost collection: Porcupine Mountain, roadside (Scoggan & Baldwin, 1950). Earliest collection seen: "Point du Chien" (Macoun, 1872). First report: near York Factory ["H", Richardson, in Franklin, 1823].

Temperate American: south-central Sask. to sw. Que., s. to Kans. and Ga.

17. **P. achoreum** Blake

Sandy prairie, shores, and waste places in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Brandon, streets and ditches (Macoun, 1896; determined by Brenckle). First report: the present publication.

Subarctic American: central Alaska and central Yukon to north-central Man. and n. Nfld., s. to Ida., Colo., Mo., Mich., and N.Y.

18. P. AVICULARE L. (Incl. *P. heterophyllum* Lindm. f.; *P. neglectum* Bess.; *P. rubescens* Small; *P. buxiforme* Small) [*See* Fernald, 1950, p. 579, footnote].

Very common in disturbed habitats throughout the province except the extreme north. Northernmost collection seen: Cochrane River, lat. 57° 58′ N., wet river bank (Baldwin, 1951). The species also will undoubtedly be found at Churchill, but specimens seen are referable to *P. boreale*. Earliest collection seen: Fort Garry (Schultz, 1860). First report: Fort Garry [Schultz, 1861]. Probable basis of the report of *P. maritimum* L. from York Factory by Bell [1881].

European: widely naturalized throughout North America, north to the Mackenzie River Delta.

## 38. CHENOPODIACEAE

(Goosefoot Family)

[*See* North American Flora 21: 1-93. 1916.]

1. Stems leafless, fleshy and jointed, the leaves reduced to small appressed opposite scales; flowers sunk in hollows of the thickened upper joints of the stem, forming a narrow fleshy spike ........................................ 1. *Salicornia*
1. Stems leafy, scarcely fleshy, not jointed, the leaves alternate; flowers not sunk in pits.
    2. Leaves filiform to linear or linear-lanceolate, entire.

3. Plant permanently hoary with dense stellate pubescence and intermingling long hairs, the pubescence at first white, later reddish-brown; flowers densely clustered in the upper leaf-axils, the 2-horned fruiting bracts densely long-hairy on the sides; leaves linear or linear-lanceolate, with revolute margins; stem woody at base.......2. *Eurotia*
3. Plants not stellate-pubescent, or, if so, soon glabrate; leaves not revolute-margined; stem not woody, but often rather hard.
    4. Leaves spiny-tipped, the principal ones filiform, 3-7 cm. long; flowers usually solitary in the axils of the shorter and broader upper leaves; plant very bushy.......3. *Salsola*
    4. Leaves not spiny-tipped, at most pointed.
        5. Leaves fleshy, orbicular or suborbicular in cross-section, dilated at base; flowers 1-5 in the leaf-axils; calyx 5-parted, one of the sepals with a horn-like appendage.......4. *Suaeda*
        5. Leaves flat, not fleshy.
            6. Flowers solitary in the axils of lanceolate to ovate, pointed, overlapping, scarious-margined bracts (these short-pubescent or glabrate), forming loose to dense spikes; calyx a single delicate sepal on the inner side; leaves not ciliate.......5. *Corispermum*
            6. Flowers clustered in the leaf-axils, forming short dense leafy spikes; calyx 5-lobed, winged in fruit; flowering branches and calyces villous, the long hairs reddish-brown in age; leaves often ciliate at base.......6. *Kochia*

2. Leaves broader, often toothed or lobed.
    7. Leaves and stem stellate-pubescent; leaves entire, those of the flowering branches bract-like; staminate spike slender, bractless, terminal on the branches; mature bracts and calyx becoming whitish and conspicuous.......7. *Axyris*
    7. Leaves and stem not stellate-pubescent, the leaves mostly lobed or toothed (entire in *Atriplex nuttallii*, with woody-based stem).
        8. Mature fruiting calyx red or purple, with a broad, continuous, membranaceous, horizontal wing; flowers very small and numerous, mostly solitary, in a diffuse panicle; leaves irregularly sinuate-dentate, the teeth tipped with a short point; stem densely branched, the slender branches angled and striate.....8. *Cycloloma*
        8. Mature fruiting calyx, when present, wingless,
            9. Calyx usually absent, the flowers and fruit embraced between a pair of triangular to suborbicular, appressed, foliaceous bractlets, these united at least at base.......9. *Atriplex*
            9. Calyx present, the flowers not embraced between bractlets.
                10. Calyx a solitary, green, bract-like, fleshy sepal; leaves scarcely mealy, hastate, passing gradually into foliaceous bracts; stem branched from the base.......10. *Monolepis*
                10. Calyx 5-parted, more or less enveloping the fruit; leaves often sparsely to densely white-mealy beneath, entire or lobed; branches ascending or prostrate.......11. *Chenopodium*

### 1. SALICORNIA L.

1. **S. rubra** Nels. Glasswort. Samphire

Alkaline flats and salt marshes in the southern third of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, salt marsh at mouth of Red Deer River (Scoggan, 1948). Earliest collection seen: Fort Garry and Assiniboine River (Schultz, 1861). First report: "Manitoba" [Fernald, Rhodora 9: 207. 1907]. Basis of reports of *S. europaea* L. from the province.

Temperate western American: B.C. to Man., s. to Wash., Nev., Kans., and Minn.

### 2. Eurotia Adans.

1. **E. lanata** (Pursh) Moq. White Sage. Winter Sage

A specimen has been seen only from Virden, where it was collected by Mrs. E. J. MacMillan (specimen undated). It is a species of dry prairie habitats. First report: Virden [Lowe, 1943].

Temperate western American: Wash. to Sask. and sw. Man., s. to Calif. and Tex.

### 3. Salsola L.

1. S. KALI L. var. TENUIFOLIA Tausch (*S. pestifer* Nels.) Russian Thistle

Sandy prairie, fields, and waste places in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railroad yard (Schofield, 1950). Earliest collection seen: Treesbank, about 20 miles southeast of Brandon (Criddle, 1908). First report: Jackson *et al.* [1922]. Basis of reports of var. *tragus* from the province by J. M. Macoun [1895; "Abundant and spreading in Manitoba."] and Burman [1910].

Eurasian: widely naturalized in North America, where it is a particularly bad weed in the western prairies. The typical form, with shorter and broader leaves, is the Common Saltwort of sandy seashores.

### 4. Suaeda Forsk.

1. **S. depressa** (Pursh) Wats. (Incl. *S. erecta* (Wats.) Nels.) Sea-Blite

Alkaline flats and salt marshes in the southern two-thirds of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, salt marsh at mouth of Red Deer River (Scoggan, 1948). Earliest collection seen: Winnipeg, edge of saline pond (Macoun, 1896). First report: Burman [1910]; but reported by Macoun [1886] "In salt marshes and around the borders of brackish ponds and lakes throughout the prairie region."

Temperate western American: B.C. to Man., s. to Calif. and Tex.

### 5. Corispermum L.

(Bugseed)

1. Fruit distinctly winged, the wing about 0·5 mm. wide; plants essentially glabrous.
    2. Spikes slender and interrupted, the axis visible; lower bracts narrower than the fruit. . . . . . . . . . 1. *C. nitidum*
    2. Spikes dense, the axis covered by the overlapping bracts, these concealing the fruits.
        3. Bracts and leaves essentially glabrous . . . . . . . . . . 2. *C. hyssopifolium*
        3. Bracts and leaves pubescent . . . . . . . . . . 3. *C. simplicissimum*
1. Fruit scarcely winged; plant glabrous . . . . . . . . . . 4. *C. orientale* var. *emarginatum*

1. **C. nitidum** Kit.

This species has been seen only from the sandhills of Grande Clarière near Hartney, about 35 miles southwest of Brandon, where it was collected by the writer in 1951. First report: the present publication.

Temperate circumpolar (with large gaps): s. Man. and shores of Lake Michigan, s. to Ariz., Tex., and Mo.; Eurasia.

2. **C. hyssopifolium** L. (*C. marginale* Rydb.)

Sandy prairie, sandhills, and beaches of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandhills (Scoggan, 1951). Earliest collection seen: "Manitoba" (Macoun, 1872). First report: Red River [Macoun, 1886].

Subarctic circumpolar: central Alaska to Great Slave L., s. Man., and w. Que., s. to Mexico; Eurasia.

3. **C. simplicissimum** Lunell

Specimens have been seen from the following localities: Goodlands, west of Turtle Mountain (Jackson, 1921); Glenboro, about 35 miles southeast of Brandon, sandhills (Scoggan, 1951); St. Lazare, about 75 miles northwest of Brandon (Selby, 1924). First report: the present publication.

Temperate western American: thus far, known only from s. Man. and N.D.

4. **C. orientale** Lam. var. **emarginatum** (Rydb.) Macbr. (*C. emarginatum* Rydb.)

Specimens have been seen from the following localities: Miami, about 40 miles south of Portage la Prairie (Jackson, 1932); Matlock Beach, south end of Lake Winnipeg (Marquardt, 1931); Gimli, about 45 miles north of Winnipeg (Dudley, 1930). First report: the present publication.

Temperate western American: Alta. to s. Man., s. to Nev. and Colo.; adventive in Mo.

### 6. Kochia Roth

1. K. scoparia (L.) Schrad. (Incl. *K. trichophylla* Stapf) Summer-cypress

Alkaline flats and waste land of southern Manitoba. Northernmost collection: Erikson, about 45 miles north of Brandon, road embankment (Scoggan, 1951). Earliest collection seen: Altona, near the International Boundary south of Winnipeg (Fletcher, 1901). First report: Lowe [1943].

Eurasian: escaped from cultivation and naturalized in the United States and adjacent Canada.

### 7. Axyris L.

1. A. amaranthoides L. Russian Pigweed

Fields and waste places throughout the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, near barn (Schofield, 1950). Earliest collection seen: Headingly, near Winnipeg (Fletcher, 1886). First report: Winnipeg and Brandon [J. M. Macoun, 1897].

Asiatic: widely naturalized throughout the United States and adjacent Canada.

### 8. Cycloloma Moq.

1. **C. atriplicifolium** (Spreng.) Coult. Winged Pigweed

Specimens have been seen from the following localities: Aweme, about 20 miles southeast of Brandon, sandy blowout in prairie (Criddle, 1906);

Stockton, about 30 miles southeast of Brandon (Wilson, 1932); Shilo, about 10 miles east of Brandon (Given, 1943; Cranston, 1949, sandy soil; Scoggan 1953, sandy clearing). First report: Aweme, Shilo, and Stockton [Lowe, 1943].

Temperate American: s. Man. to Ind., s. to Ariz., Tex., and Ark.; introduced eastward to Que. and N.E.

## 9. ATRIPLEX L.

(Orach)

[*See* North American Flora 21: 33-72. 1916; Hall and Clements, 1923.]

1. Plants perennial, woody at base and much branched; leaves entire, unlobed, oblong or obovate, 2-4 cm. long, rounded at apex, cuneate at base, densely grey-scurfy; fruiting bracts indurate, 3-5 mm. long, united to above the middle ............... 1. *A. nuttallii*
1. Plants annual, not woody at base; leaves mostly lobed or toothed.
    2. Leaves densely greyish-scurfy, triangular-ovate, rhombic or rounded-ovate, often subhastate, truncate to rounded or broadly cuneate at base, 2-6 cm. long; fruiting bracts 5-10 mm. long, united nearly to the apex .......................... 2. *A. argentea*
    2. Leaves bright-green to densely scurfy, at least the lower ones often hastate; fruiting bracts united only at the broad base.
        3. Pistillate flowers of two kinds, some of them with a regular 3-5-lobed green calyx, most of them merely enclosed by 2 suborbicular bracts, these up to 18 mm. long; leaves bright green, at most thinly scurfy, triangular to triangular-ovate or lance-oblong, 4-12 (-20) cm. long, often hastately lobed ................. 3. *A. hortensis*
        3. Pistillate flowers all uniform, all without a calyx; fruiting bracts smaller.
            4. Spike-like inflorescence leafy-bracted to tip; fruiting bracts 5-12 mm. long, the sides sparsely pebbled; seeds 2-4 mm. broad; leaves triangular to ovate, very fleshy ................................................... 4. *A. glabriuscula*
            4. Spike-like branches of the inflorescence leafy only at base; fruiting bracts 2-7 mm. long, their sides freely pebbled; seeds 1-2 mm. broad; leaves rather thin to fleshy, at least the lower ones hastate.
                5. Principal leaves lance-hastate, entire or slightly dentate, the upper ones narrower and not hastate ................................. 5. *A. patula*
                5. Principal leaves triangular-hastate to rounded-deltoid, often toothed, the upper ones narrower and entire but often subhastate..... 5a. *A. patula* var. *hastata*

### 1. **A. nuttallii** Wats.

Specimens have been seen from the following localities: Brenda, northwest of Turtle Mountain (Jackson, 1921); Melita, about 60 miles southwest of Brandon, alkaline flats of old Souris River channel (Scoggan, 1951); Thornhill, about 40 miles south of Portage la Prairie, dry alkaline prairie (Lowe, 1941); Morden, about 60 miles southwest of Winnipeg (Lowe, 1941). Also reported from Morris and North Star by Lowe [1943]. First report: Burman [1910].

Temperate western American: Alta. to s. Man., s. to Nev., Colo., and Neb.

### 2. **A. argentea** Nutt. Saltbush

Specimens have been seen from the following localities: Melita, about 60 miles southwest of Brandon, alkaline flats of old Souris River channel

(Scoggan, 1951); Miniota, about 50 miles west-northwest of Brandon, dry alkaline prairie (Scoggan, 1953). First report: Glenboro [Lowe, 1943].

Temperate western American: B.C. to s. Man., s. to Calif. and Tex.; introduced eastward.

3. A. HORTENSIS L. Garden Orach

Specimens have been seen from the following localities: Winnipeg (Batho, 1938); Stonewall, northwest of Winnipeg (Denike, 1942); Fort Garry (Higham, 1940); Morris, about 35 miles south of Winnipeg (Macoun, 1896); Brandon (Groh, 1922). First report: Lowe [1943].

Asiatic: spread from cultivation in the United States and adjacent Canada.

4. **A. glabriuscula** Edmonston

A single specimen has been seen from Churchill, where it was collected by Polunin in 1936. It is a species of coastal habitats. First report: the present publication; but accredited to northern Manitoba in the range assigned the species by Fernald [1950].

(Subarctic-)temperate eastern American: n. Man. to s. Lab. and Nfld., s. to e. Que. and s. N.E.; s. Greenland; Iceland.

5. **A. patula** L.

Moist alkaline prairie, shores, and waste land throughout the province except the extreme north. Northernmost collection: Churchill (Gardner 1933; Gillett, 1948). Earliest collection seen: Red River near Winnipeg (Macoun, 1896). First report: Churchill [Størmer, 1933]. Basis of the report of *Chenopodium urbicum* L. from Selkirk by Jackson *et al.* [1922] and Lowe [1943].

(Subarctic-)temperate circumpolar: s. Alaska, n. Alta., and n. Man. to e. Que. and Nfld., s. to B.C., Mo., and N.E.; Eurasia.

5a. **A. patula** var. **hastata** (L.) Gray

Similar habitats in the southern third of the province. Northernmost collection seen: Dawson Bay, Lake Winnipegosis, salt marsh near mouth of Red Deer River (Scoggan, 1948, 1950). Earliest collection seen: Brandon, along street (Macoun, 1896). First report: "Very common on newly broken saline soil from Winnipeg to Laggan in the Rocky Mountains." [Macoun, 1886].

Range of the species. Reported from Churchill by Ritchie [1956].

## 10. MONOLEPIS Schrad.

1. **M. nuttalliana** (R. & S.) Greene (*M. chenopodioides* Moq.) Povertyweed

Alkaline prairie, salt marshes, and waste land throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936; Gillett, 1948, common in cinder area). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, borders of salt lakes and marshes (Macoun, 1872). First report: "Abundant in numerous places on the Souris Plain." [Macoun, 1886].

Subarctic western American: n. Alaska and central Yukon to n. Man., s. to Mexico; introduced eastward.

### 11. CHENOPODIUM L.

### (Goosefoot. Pigweed)

[*See* N. Am. Fl. 21: 9-32. 1916; Aellen and Just, 1943; Wahl, 1954.]

1. Flowers in dense globose clusters 5-15 mm. thick, becoming fleshy and red in age, the clusters forming stout interrupted spikes; leaves mostly triangular or triangular-hastate and irregularly sinuate-dentate; plant glabrous........................1. *C. capitatum*
1. Flowers in smaller clusters, not becoming fleshy and red.
2. Seed vertical.
3. Leaves green (the whole plant glabrous or nearly so), up to 15 cm. long, deltoid-ovate or rhombic-ovate, hastate or coarsely toothed; stem erect............2. *C. rubrum*
3. Leaves densely white-mealy beneath with inflated hairs, mostly less than 3 cm. long, oblong-ovate to deltoid-ovate, coarsely sinuate-dentate; stems often spreading on the ground....................................3. *C. glaucum* ssp. *salinum*
2. Seed horizontal.
4. Leaves (at least the larger ones) rounded or subcordate at base, acuminate, thin, coarsely sinuate-lobed, green and glabrous; flowers in small clusters in a large, loose, terminal panicle......................4. *C. hybridum* var. *gigantospermum*
4. Leaves tapering or subtruncate at base (if rounded, thick and not acuminate); panicles smaller and more compact.
5. Pericarp free from or easily removed from the seed.
6. Leaves densely white-mealy beneath, thickish, linear to linear-lanceolate or narrowly oblong, entire or occasionally with two small basal lobes, short-petioled.
7. Leaves mostly 1-nerved..............................5. *C. leptophyllum*
7. Leaves 3-nerved.......................................6. *C. pratericola*
6. Leaves glabrous above, only sparsely mealy beneath, thin, the larger ones ovate-lanceolate to broadly triangular and usually hastate, their petioles often nearly as long as the blade................................7. *C. fremontii*
5. Pericarp adherent to the seed.
8. Seeds usually minutely punctate; plant ill-scented...........8. *C. berlandieri*
8. Seeds smooth and shining; plants not ill-scented.
9. Leaves ovate-lanceolate, mostly entire, nearly glabrous in age.............
....................................9. *C. strictum* var. *glaucophyllum*
9. Leaves mostly rhombic-ovate to rhombic and more or less sinuate-dentate, white-mealy beneath, often even in age.....................10. *C. album*

1. **C. capitatum** (L.) Asch. (*Blitum capitatum* L.) Strawberry-Blite

Rocky ground, clearings, burned areas, etc., throughout the province except the extreme north. Northernmost collection: Churchill (Beckett, 1946). Earliest collection seen: Dawson Road, southeastern Manitoba, low ground (Dawson, 1873). First report: "Winnipeg and N. W. Angle Road" [Dawson, 1875].

Subarctic circumpolar: central Alaska, Mack. R. Delta, and Great Bear L. to n. Man., the Great Lakes region, and e. Que., s. to Calif., N.M., Minn., and Pa.; Eurasia.

2. **C. rubrum** L. Coast-Blite

Alkaline prairie, salt marshes, and waste places of southern Manitoba. Northernmost collection: Swan River, north of Duck Mountain (Groh, 1922). Earliest collection seen: Winnipeg, streets (Macoun, 1896). First report: [1910]. Some of the Manitoba material may be referable to the low-growing forma *humile* (Hook.) Asch. & Graebn., Fernald [1950] including Manitoba in the range of C. *humile* Hook.

Subarctic circumpolar: south-central Yukon and n. Alta. to s. Man. and Nfld., s. to s. Calif., N.M., Neb., Mo., and N.J.; Eurasia.

3. C. GLAUCUM L. var. SALINUM (Standl.) Boivin (*C. salinum* Standl.) Oak-leaved Goosefoot

Alkaline prairie, salt marshes, and waste places throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936; Beckett, 1946). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, margins of saline marshes and lakes (Macoun, 1872). First report: Lyleton [Lowe, 1943]. Basis of reports of the main form from the province. [*See* Boivin, Canadian Field-Naturalist 65: 17. 1951].

Eurasian: widely naturalized in North America.

4. **C. hybridum** L. var. **gigantospermum** (Aellen) Rouleau (*C. gigantospermum* Aellen) Maple-leaved Goosefoot

Thickets, shores, and clearings in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, shore (Scoggan, 1949). Earliest collection seen: Black River, near the southeast end of Lake Winnipeg, damp shores (Macoun, 1884). First report: shores of Lake Winnipeg [Macoun, 1886].

Subarctic American: south-central Yukon to central Alta., central Man., and Que., s. to Calif., N.M., Mo., and Va.; the whole species circumpolar.

According to Fernald [Rhodora 51: 92. 1949] and Gleason [1952], the character of seed-size is not sufficiently stable to warrant the separation of *C. gigantospermum* as a distinct entity, but Hultén [1944] considers the smoothness of the seeds of the American plant so marked a feature as to justify specific status. According to Löve [Svensk Botanisk Tidskrift 48: 219. 1954], "The American material studied so far suggests that the plant is probably an alloploid, presumably between *Ch. hybridum* s. str. and some other closely related diploid."

5. **C. leptophyllum** Nutt.

Dry prairie slopes, sandhills, and waste land of southern Manitoba. Northernmost collection: Miniota, about 50 miles west-northwest of Brandon, dry prairie slope (Scoggan, 1953). Earliest collection seen: near Winnipeg, alkaline prairie (Macoun, 1872). First report: Jackson *et al.* [1922].

Temperate American: B.C. to Ont. and Me., s. to Calif., O., and Va.; Mex.; introduced in Yukon and Mack., and Europe.

6. **C. pratericola** Rydb.

A single specimen, determined by H. A. Wahl, has been seen from Winnipeg (Higham, 1920). This species is doubtfully distinct from the foregoing one. First report: the present publication.

Temperate American: Wash. to Man. and N.J., s. to Calif., Tex., Ind., and Va.; Mexico; Argentine.

7. **C. fremontii** Wats.

Specimens have been seen from the following localities: Rock Lake, about 50 miles southeast of Brandon (Groh, 1932, thickets; Scoggan, 1953, talus below limestone cliffs); Brandon (Stevenson, 1951, waste land); Melita, about 60 miles southwest of Brandon, street border (Scoggan, 1953); Wawanesa, about 20 miles southeast of Brandon, denuded crest of slope above Souris River (Scoggan, 1953); Morris, about 30 miles south of Winnipeg, street border (Scoggan, 1953). First report: the present publication.

Temperate western American: B.C. to s. Man., s. to Calif. and Tex.; n. Mex.; s. Yukon (probably introduced).

8. **C. berlandieri** Moq.

Specimens have been seen from the following localities: Winnipeg (Mawson, 1918; Brodie, 1927); Morden, about 60 miles southwest of Winnipeg, gravelly hill (Marshall, 1939). It is a species of dry open habitats. The Brodie specimen from Winnipeg is referred by Wahl to ssp. *platyphyllum* (Issler) Ludwig (leaves broadest below the middle); the two remaining specimens are referred by Wahl to ssp. *zschackei* (Murr) Zobel (leaves broadest at or above the middle). First report: the present publication. Probable basis of the citation of *C. boscianum* Moq. (*C. berlandieri* ssp. *boscianum* (Moq.) Aellen) from Brenda, near Turtle Mountain, by Lowe [1943].

Temperate American (the collective species): Wash. to Man., Ill., and Va., s. to Calif. and Fla.; Mexico.

9. **C. strictum** Roth var. **glaucophyllum** (Aellen) Wahl

Specimens have been seen from the following localities: Winnipeg area (Swailes, 1944; Smith, 1944; both specimens determined by Wahl); Grande Clarière, near Hartney, about 35 miles southwest of Brandon, sand dunes (Scoggan, 1951). First report: the present publication.

Temperate eastern American: known from Man., S.D., Minn., and Miss.

10. C. ALBUM L. Lamb's-quarters. Pigweed

Fields and waste ground throughout the province except the extreme north. Northernmost collection: Churchill (Gardner, 1933; Polunin, 1936; Gillett, 1948). Earliest collection seen: Brandon, field (Macoun, 1896).

First report: Fort Garry [Schultz, 1861]. Basis of the citation of *C. urbicum* L. from Brenda, near Turtle Mountain, by Lowe [1943].

Eurasian: widely naturalized in North America.

*C. bonus-henricus* L., reported by Christy [1887] and Shimek [1927] from the Carberry area, is probably referable to one of the foregoing species.

### ***Sarcobatus*** Nees

*S. vermiculatus* (Hook.) Torr., Greasewood, is listed by Burman [1910], but reported only from Wood Mountain, Saskatchewan, by Jackson *et al.* [1922] and Lowe [1943]. It probably does not occur in Manitoba.

## 39. AMARANTHACEAE

## (Amaranth Family)

1. Flowers monoecious, all with a calyx of 3 or 5 distinct sepals..........1. *Amaranthus*
1. Flowers dioecious, the pistillate ones without a calyx........................2. *Acnida*

### 1. Amaranthus L.

### (Amaranth)

1. Leaf-axils mostly bearing a pair of rigid sharp-pointed spines, these 2-25 mm. long; fruit irregularly and imperfectly circumscissile; leaf-blades 1·5-12 cm. long, dark green, glabrous or sparingly pubescent, acute at base..........................*A. spinosus*
1. Leaf-axils without spines; fruit regularly circumscissile.
    2. Flowers in dense contracted panicles terminating the branches; stamens and sepals 5; principal leaves with blades mostly 5-30 cm. long; stems coarse, erect or strongly ascending.
        3. Pistillate calyx 1·5-2 mm. long, the bracts at most twice as long; lateral spikes of terminal panicle spreading-ascending to erect.......................2. *A. hybridus*
        3. Pistillate calyx about 3 mm. long, the bracts 2-3 times as long; lateral spikes of terminal panicle strongly ascending...........................1. *A. retroflexus*
    2. Flowers in axillary clusters; stamens and sepals 3; principal leaves with blades 0·5-7 cm. long; stems relatively slender, depressed to ascending.
        4. Bracts subulate, ending in a rigid sharp point, much exceeding the calyx; seeds about 0·8 mm. broad; stem white, erect or ascending, diffusely branched...........................3. *A. albus*
        4. Bracts ovate-oblong, short-acuminate, not much longer than the calyx; seeds 1·3-1·5 mm. broad; stem white or often purplish, prostrate or decumbent...........................4. *A. graecizans*

1. A. retroflexus L. Green Amaranth. Pigweed

Fields and waste ground throughout the southern half of the province. Northernmost collection: The Pas, garden (Krivda, 1951). Earliest collection seen: Lake of the Woods, Man., low ground (Dawson, 1873). First report: Lake of the Woods [Dawson, 1875].

Tropical American: widely naturalized throughout the world.

2. A. HYBRIDUS L. Green Amaranth. Pigweed

A specimen appearing referable here has been seen from Winnipeg (Batho, 1938). Further study should be made of this and the foregoing species in the province. First report: the present publication.

Tropical American: widely naturalized throughout the world.

3. **A. albus** L. Tumbleweed

Sandy prairie and waste ground of southern Manitoba. Northernmost collection: Benito, off the northwest edge of Duck Mountain, clay road embankment (Scoggan, 1951). Earliest collection seen: Winnipeg (Groh, 1922). First report: Burman [1910].

Temperate western American: now widely naturalized throughout much of North America and other parts of the world.

4. **A. graecizans** L. (A. *blitoides* Wats.) Tumbleweed

Sandy prairie and waste ground of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy prairie (Scoggan, 1951). Earliest collection seen: Killarney, near Turtle Mountain, roadside (Macoun, 1896). First report: Jackson *et al.* [1922].

Temperate western American: B.C. to Man., s. to Calif. and Tex.; naturalized eastward.

*A. spinosus* L., Thorny Amaranth, was collected on a golf course at Fort Garry by Hutchinson in 1921 but is not a naturalized member of our flora. It is believed to have been introduced with grass seed from Texas.

### 2. ACNIDA L.

1. **A. tamariscina** (Nutt.) Wood Water-Hemp

A single specimen has been seen: banks of Souris River (T. L. Walker, 1889). First report: the present publication.

Temperate American: Man. to Wisc., s. to N.M., Tex., Ark., and Ky.; introduced eastward.

## 40. NYCTAGINACEAE

(Four-o'clock Family)

### 1. MIRABILIS L.

(Four-o'clock)

1. Leaves ovate or ovate-lanceolate, all except the uppermost petioled and with rounded to cordate bases; plant nearly glabrous, the inflorescence only slightly pubescent....................1. *M. nyctaginea*
1. Leaves lanceolate to linear-lanceolate, cuneate at the sessile or subsessile bases; plant more or less glandular-hirsute....................2. *M. hirsuta*

1. **M. nyctaginea** (Michx.) MacM. (*Allionia nyctaginea* Michx.; *Oxybaphus nyctagineus* (Michx.) Sweet)

Dry prairie habitats and rocky ground of southern Manitoba. Northernmost collection: Victoria Beach, about 55 miles north-northeast of

Winnipeg (Buller, 1917). Earliest collection seen: Portage la Prairie (McMorine, 1896). First report: Burman [1910].

Temperate American: Mont. to Man. and Wisc., s. to Colo., Tex., La., and Ala.

2. **M. hirsuta** (Pursh) MacM. (*Allionia hirsuta* Pursh; *Oxybaphus hirsutus* (Pursh) Sweet)

Dry prairie slopes and sandhills of southern Manitoba. Northernmost collection: Millwood, about 90 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Pine Creek, west of Portage la Prairie, open prairie (Macoun, 1872). First report: Pine Creek [Macoun, 1886]. Basis of reports of *Allionia pilosa* and *A. decumbens* from the province.

Temperate western American: Sask. to Man. and Wisc., s, to Ariz., Tex., and Mo.; adventive eastward to N.E.

## 41. PORTULACACEAE

### (Purslane Family)

1. Stem prostrate and much branched, forming circular mats; leaves many, very fleshy, obovate or cuneate, clustered at the ends of the branches; flowers sessile, pale yellow; upper part of globular capsule separating as a lid........................1. *Portulaca*
1. Stem erect; leaves few, scattered, linear to linear-oblanceolate, the lower ones somewhat fleshy; flowers pedicelled, pinkish (especially on the nerves of the petals); (capsule presumably 3-valved)..........................................2. *Claytonia*

### 1. PORTULACA L.

1. P. OLERACEA L. Common Purslane

Gardens and waste ground of southern Manitoba. Northernmost collection seen: Victoria Beach, about 55 miles north-northeast of Winnipeg (Simpson, 1937); but reported "About Norway House, and banks of the Hill River" by Hooker [1834]. Earliest collection seen: Winnipeg (Dudley, 1929). First report: the foregoing citation by Hooker.

European: widely naturalized in North America.

### 2. CLAYTONIA L.

### (Spring-beauty)

1. **C. bostockii** Porsild

A specimen in the National Herbarium of Canada (Mile 349 on the Hudson Bay Railway, about 160 miles south of Churchill, P. A. Taverner, 1936) has been tentatively referred to this species by Porsild. First report Porsild [1951].

(Subarctic-)temperate western American: known only from southern Yukon and northern Manitoba.

## 42. CARYOPHYLLACEAE

### (Pink Family)

1. Calyx with sepals distinct or united only at base; petals without claws.
   2. Stipules present, scarious; petals entire; styles and valves of capsule 3; leaves fleshy, linear, glandular-pubescent or glabrous; plant of saline habitats.........1. *Spergularia*
   2. Stipules absent.
      3. Petals entire or merely notched at apex; capsules opening by as many entire or at length 2-cleft valves as there are styles.
         4. Leaves linear-subulate, or those of the flowering branches much reduced and scale-like; styles as many as the sepals and alternate with them.......2. *Sagina*
         4. Leaves linear-filiform to dilated; styles usually 3, opposite as many sepals...........................................................3. *Arenaria*
      3. Petals deeply notched or 2-cleft; capsules opening by twice as many valves or teeth as there are styles.
         5. Styles 3, opposite as many sepals; capsules short, ovate or oblong, opening by 6 valves.......................................................4. *Stellaria*
         5. Styles 5, opposite the sepals; capsules long, cylindrical, often bent or curved near summit, opening by 10 teeth at the summit......................5. *Cerastium*
1. Calyx with sepals united into a tube; petals with basal claws.
   6. Calyx subtended by an involucre of slender subulate-tipped bracts; styles 2; flowers large and showy, usually roseate, in dense clusters; leaves lanceolate.....6. *Dianthus*
   6. Calyx naked at base.
      7. Calyx-lobes prolonged and leaf-like, 2-4 cm. long, much overtopping the large purplish-red petals and the capsule; calyx with 10 strong long-hairy ribs; styles 5, opposite the petals; leaves linear...............................7. *Agrostemma*
      7. Calyx-lobes not long-tipped.
         8. Styles 5, alternate with the petals................................8. *Lychnis*
         8. Styles 2 or 3.
            9. Styles 3; capsule 3-valved or 6-valved; calyx 10-nerved.............9. *Silene*
            9. Styles 2; capsule 4-valved; calyx 5-nerved.
               10. Leaves lance-acuminate; petals white, very small, about equalling the calyx; calyx 2-3 mm. long, the teeth suborbicular, with green centre and white-scarious margin.................................10. *Gypsophila*
               10. Leaves ovate-lanceolate; petals pale red, much longer than the calyx; calyx 5-angled, in fruit about 12 mm. long and wing-angled...........................................................11. *Saponaria*

### 1. SPERGULARIA J. & C. Presl

### (Sand-Spurrey)

1. **S. marina** (L.) Griseb. (*S. salina* J. & C. Presl)

Alkaline flats and salt marshes in the southern third of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, salt marsh at mouth of Red Deer River (Scoggan, 1948). Earliest collection seen: near Winnipeg (Lowe, 1909). First report: Sturgeon Creek, near Winnipeg [Jackson *et al.*, 1922; as *Tissa marina*]. Basis of earlier reports of *S. media* from the province [Macoun & Gibson, 1876; Macoun, 1883; Burman, 1910].

(Subarctic-)temperate circumpolar: s. Alaska and n. Alta. to south-central Man. and Nfld., s. to Calif. and Fla.; S. Am.; Eurasia. A map of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Rossbach [Rhodora 42: 81 (map 7). 1940].

## 2. SAGINA L.

(Pearlwort)

1. Petals about equalling the sepals; upper leaves slender, not bearing dense bulb-like tufts in their axils; plant of the far-northern region........................1. *S. cespitosa*
1. Petals about twice the length of the sepals; upper leaves scale-like, subtending dense axillary bulb-like tufts........................2. *S. nodosa*

### 1. **S. cespitosa** (J. Vahl) Lange

Known in the province only from dry rocky barrens and gravelly hillocks by Baralzon Lake, lat. 60° N. (Scoggan & Baldwin, No. 8206, Aug. 5, 1950). First report: the present publication. Basis of the report of *S. intermedia* Fenzl from Baralzon Lake by Scoggan [1952].

Arctic amphi-Atlantic: north-central Keewatin, south-central Baffin I., and n. Lab., s. to n. Man. and n. James Bay; reported also from mts. of Colo.; southern half of Greenland; Iceland; nw. Europe.

### 2. **S. nodosa** (L.) Fenzl

Specimens have been seen from the following localities: Muskeg Island, Lake Winnipeg (Macoun, 1884); Pipestone Lake, north of Lake Winnipeg, rocky shore (Scoggan, 1948); Gillam, about 165 miles south of Churchill (Schofield, 1950); Hayes River about 20 miles southwest of York Factory, clay beach (Scoggan, 1949); York Factory (McTavish, 1854; Scoggan, 1949, edge of pool); Cochrane River, lat. 58° 02′ N., mud (Baldwin, 1951); Churchill (Porsild, 1930). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

(Arctic-)subarctic ?circumpolar: Great Bear L. and central Keewatin to s. Baffin I., n. Que., e. Lab., and Nfld., s. to nw. Sask., n. Minn., and e. Me.; s. Greenland; Europe; w. Asia.

## 3. ARENARIA L.

(Sandwort)

1. Leaves lanceolate to oval or oblong (rarely linear); sepals obscurely nerved; margins of capsule-valves not wiry-thickened.
    2. Plant fleshy and succulent, its deep roots much branched in sea beach sand (Hudson Bay); valves of the subglobose leathery capsule entire.
        3. Flowers in terminal leafy broad cymes........................1. *A. peploides*
        3. Flowers few, terminal and axillary, not in broad cymes...*A. peploides* var. *diffusa*
    2. Plants not fleshy; valves of the cylindric to ovoid capsule deeply split.
        4. Stems filiform, creeping, forming dense or loose mats; leaves overlapping or remote, thickish, glabrous, 2-10 mm. long; petals barely equalling the sepals; plant of the Hudson Bay region........................2. *A. humifusa*
        4. Stems capillary, erect or ascending, simple to loosely branched; leaves puberulent, thin, the principal ones 0·7-3·5 cm. long; petals longer than the sepals.
            5. Leaves oval to narrowly oblong........................3. *A. lateriflora*
            5. Leaves linear, linear-elliptic, or linear-lanceolate...*A. lateriflora* var. *angustifolia*
1. Leaves linear-subulate, the majority of them crowded near the bases of the tufted filiform wiry stems; petals shorter than to only slightly exceeding the sepals; valves of the capsule essentially entire, their margins wiry-thickened.

6. Plant more or less glandular-hairy; sepals and leaves strongly 3-ribbed; small plant of the Hudson Bay region........................................4. *A. rubella*

6. Plant glabrous.

  7. Calyx usually 2-3 mm. long, nerveless (or 3-nerved on drying); seeds globular; leaves essentially nerveless; stems mostly simple, 1-3-flowered; low plant of the Hudson Bay region........................................5. *A. uliginosa*

  7. Calyx usually 3-5 mm. long, strongly 3-nerved; seeds oblong; leaves 3-nerved, the midrib prominent; stems taller, much branched above, many-flowered........................................6. *A. dawsonensis*

1. **A. peploides** L. (Incl. var. *diffusa* Hornem.; *Honkenya peploides* (L.) Ehrh.) Seabeach-Sandwort

Specimens have been seen only from Churchill, the earliest collection seen from that locality being one made by Macoun in 1910, although it is reported by Bell [1880] from Churchill River. First report: near York Factory ["H", Richardson, in Franklin, 1823]. It is a species of coastal sands.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Banks I.), n. Que., n. Lab., and Nfld., s. along the coasts to Oreg., James Bay, and Va.; southern half of Greenland; Iceland; n. Eurasia.

2. **A. humifusa** Wahl.

Specimens have been seen only from the Churchill area, where it was first collected in 1930 by Porsild. It is a species of muskeg and tundra habitats. First report: Raup [1947, pl. XXIII, map showing a station for the species at Churchill].

Arctic amphi-Atlantic: Seward Pen., Alaska, n. coast of Mack., Can. Arct. Arch. (to s. Ellesmereland), n. Que., n. Lab., and Nfld., s. to s. B.C., James Bay, and e. Que.; w. Greenland; Iceland; Scandinavia. In addition to the above map of Raup, one of the circumpolar distribution is given by Raymond [1950, fig. 10].

3. **A. lateriflora** L. (*Moehringia lateriflora* (L.) Fenzl) Grove-Sandwort

Moist woods, thickets, meadows, and shores throughout the province except the extreme north. Northernmost collection: Mosquito Point, 7 miles north of Churchill, open forests and muskegs, river-banks (Porsild, 1930). Earliest collection seen: York Factory (McTavish, 1854). First report: Dufferin, Pembina Mountain, and Souris River [Dawson, 1875].

Subarctic circumpolar: Seward Pen., Alaska, Mack. R. Delta, and Great Bear L. to n. Man., James Bay, s. Lab., and Nfld., s. to Oreg., N.M., Mo., and Md.; Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XXIII].

*A. lateriflora* var. *angustifolia* (Regel) St. John is reported by St. John [Rhodora 19: 262. 1917] from Mile 214 of the Hudson Bay Railway, about 240 miles southeast of Churchill (Emerton, 1917). It seems scarcely worthy of separation from the main form.

4. **A. rubella** (Wahl.) Sm. (*A. verna* L., vars. *rubella* Wats., *propinqua* Fern., and *pubescens* Fern.; *A. propinqua* Richards.)

Specimens have been seen only from Churchill, the earliest collection seen from that locality being one made by Macoun in 1910. First report:

Raup [1947; pl. XXIII, map showing a station for the species (*A. verna* var. *pubescens*) at Churchill]. Basis of reports of *A. verna* from York Factory [Bell, 1881; Macoun, 1883] and of *A. verna* var. *hirta* from the "Shore of Hudson's Bay at York Factory and Fort Churchill" [Bell, 1884].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., n. Lab., and Nfld., s. to Calif., N.M., James Bay, and n. Vt.; circumgreenlandic; Iceland; n. Eurasia.

5. **A. uliginosa** Schleich. (*Minuartia stricta* (Sw.) Hiern., not *Arenaria stricta* Michx.) [*See* Polunin, 1940, pp. 202-203; Porsild, 1951, pp. 166, 169].

Specimens have been seen only from Gillam, about 165 miles south of Churchill (Schofield, 1950, dry sandy hillside), and Churchill (Porsild, 1930; Gardner, 1930). First report: the present publication.

Arctic ?circumpolar: n. Alaska and Great Bear L. to central Keewatin, n. Baffin I., and n. Que., s. to s. Yukon, n. Man., James Bay, and w. Lab.; Greenland; Iceland; Spitsbergen; n. Europe.

6. **A. dawsonensis** Britt. (*A. litorea* Fern.; *Sabulina litorea* (Fern.) Rydb.; *A. stricta* Michx. ssp. *dawsonensis* (Britt.) Maguire)

Open rocky ground, gravelly clearings, and beaches throughout the province except the extreme north. Northernmost collection: Churchill (Beckett, 1953). Earliest collection seen: St. Lazare, about 75 miles northwest of Brandon, rocky, gravelly, and sandy soil (Macoun, 1879). First report: Stony Mountain, near Winnipeg [Jackson *et al.*, 1922]. Basis of reports of *A. stricta* Michx. (*A. michauxii* (Fenzl) Hook., not *Minuartia stricta* (Sw.) Hiern.) from the province, this being an eastern species with petals about twice as long as the sepals.

Subarctic American: north-central Alaska and Great Bear L. to n. Man. and Nfld., s. to B.C., S.D., Ont., and e. Que. A map of the area, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXIII].

*A. groenlandica* (Retz.) Spreng., reported by Radforth [1950] from Churchill, is an eastern species. The citation is almost certainly referable to one of the above northern species.

### 4. STELLARIA L.

### (Chickweed. Starwort)

1. Leaves elliptic to ovate or obovate, at least the lower ones long-petioled; sepals more or less pubescent; plant of cultivated areas and waste places................1. *S. media*
1. Leaves all sessile or nearly so.
    2. Leaves linear to lanceolate, keeled beneath, rigid.
        3. Sepals glabrous.
            4. Flowers in the axils of scarious bracts or scarious-margined leaves of usually well-developed cymes..........................................2. *S. longipes*
            4. Flowers solitary (rarely 2) in the axils of normal stem-leaves, scarious bracts wanting; plant of the Hudson Bay and northern regions.........3. *S. monantha*
        3. Sepals ciliate on the margin, glabrous or pubescent on the back; plants of the Hudson Bay region.

5. Sepals glabrous or nearly so on the back; flowers in the axils of scarious bracts or scarious-margined leaves.............................4. *S. ciliatosepala*
5. Sepals more or less pubescent on the back; flowers in the axils of normal stem-leaves, scarious bracts wanting.......................................*S. laeta*

2. Leaves not keeled, soft or firm but not rigid.
  6. Plants matted and more or less fleshy; leaves less than 1·5 cm. long; petals only slightly exceeding the sepals.
    7. Plant very fleshy; leaves oval or elliptic, blunt; seeds smooth; plant of the Hudson Bay region...............................................5. *S. humifusa*
    7. Plant less fleshy; leaves linear-oblong, acutish; seeds wrinkled....6. *S. crassifolia*
  6. Plants neither matted nor conspicuously fleshy.
    8. Bracts of cymes green and leaf-like; petals shorter than the sepals or wanting.
      9. Leaves ovate to elliptic-lanceolate, up to 2·5 cm. long........7. *S. calycantha*
      9. Leaves lance-linear to lanceolate, mostly 2·5-7 cm. long.
        10. Flowers few, in the axils of scarcely reduced upper leaves.....................................................7a. *S. calycantha* var. *isophylla*
        10. Flowers numerous, in the axils of much reduced leaves.....................................................7b. *S. calycantha* var. *floribunda*
    8. Bracts of cymes scarious and scale-like.
      11. Petals wanting or inconspicuous; leaves elliptic to oblanceolate or oblong-linear; stems often rooting at the nodes.......................8. *S. alsine*
      11. Petals conspicuous, exceeding the sepals; leaves linear to lanceolate; stems rooting only at base.
        12. Sepals firm, 3-nerved; leaves lanceolate, broadest near the minutely ciliate base; cymes terminal; seeds finely roughened.............9. *S. graminea*
        12. Sepals almost nerveless; leaves linear, acutish at both ends; cymes soon lateral; seeds smooth.
          13. Capsules greenish or greenish-yellow; outer sepals non-ciliate.....................................................10. *S. longifolia*
          13. Capsules lustrous brownish-black; outer sepals minutely ciliate; plant of the Hudson Bay region.............10a. *S. longifolia* var. *atrata*

1. S. MEDIA (L.) Cyrillo Common Chickweed

Gardens, open ground, and waste places throughout the province except the extreme north. Northernmost collection: Churchill (Macoun, 1910). Earliest collection seen: York Factory (McTavish, 1863). First report: York Factory [Bell, 1881].

Eurasian: widely naturalized in North America.

2. **S. longipes** Goldie (Incl. *S. stricta* Richards.; *S. strictiflora* Rydb.) [For a discussion of this and the following two species, *see* Hultén, Botaniska Notiser, 1943, pp. 251-270; Böcher, Botanisk Tidsskrift 48: 401-420. 1951].

Thickets, rock outcrops, and sandy or gravelly clearings throughout the province except the extreme north. Northernmost collection: Churchill (many collections, the first seen being one made by McTavish in 1853). Earliest collection seen: the foregoing McTavish specimen from Churchill. First report: Lake Winnipeg [Hooker, 1830; as *S. stricta*].

(Arctic-)subarctic? circumpolar: n. Alaska to south-central Keewatin, n. Que., n. Lab., and Nfld., s. to Calif., N.M., Minn., Ind., and N.Y.; southern half of w. Greenland; n. Eurasia (gap in w. Europe). A map of the distribution is given in the above cited paper of Hultén (p. 255)

3. **S. monantha** Hult.

Specimens have been seen from the following localities: Churchill, sandy and gravelly places (Dore, 1949); Baralzon Lake, lat. 60° N., shore (Scoggan & Baldwin, 1950). First report: Churchill [Ritchie, 1956].

Arctic American (the collective species): n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., n. Lab., and Nfld., s. to Wash., Wyo., Colo., n. Man., and e. Que.; w. Greenland; e. Asia. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given in the above-cited paper of Hultén (p. 267, fig. 9).

4. **S. ciliatosepala** Trautv. (Incl. *S. subvestita* Greene)

Specimens have been seen from the following localities: York Factory (McTavish, 1853 or 1854; Scoggan, 1949, open rocky ground and clay or gravel beaches); Churchill (several collections, the first by Macoun in 1910; sandy or gravelly open habitats); Nueltin Lake, lat. 59° 48′ N., barren exposed island (Baldwin, 1951). First report: Churchill [Ritchie, 1956].

Arctic ?circumpolar (large gaps in w. Europe and ne. Asia): n. coast of Alaska, Yukon, and nw. Mack., Can. Arct. Arch. (to central Ellesmereland), s. to s. Yukon, n. Man., and s. Baffin I.; Greenland; arctic Eurasia. Maps of the distribution (incomplete in the north for North America) are given in the above-cited papers of Hultén (p. 258, fig. 4) and Böcher (p. 417, fig. 5).

*S. laeta* Richardson is included in the checklist of Lowe [1943], but specimens so-named appear to be referable to one of the foregoing three species.

*S. edwardsii* R. Br., reported by Rae [1850] from between York Factory and Churchill, is probably referable to *S. ciliatosepala*. A discussion is given in the above-cited paper of Hultén, pp. 259-260.

*S. longipes* var. *minor* Hook., reported from Echimamish River to Oxford House by Macoun [1883], and from York Factory and Churchill by Bell [1884], is probably referable to either *S. ciliatosepala* or *S. monantha*.

5. **S. humifusa** Rottb. (Incl. var. *suberecta* Boivin)

Known in the province only from Churchill: (Polunin, 1934; MacKinnon, 1947, sandy beach above high water; Beckett, 1948, gravelly soil; Dore, 1949, wet shore of lagoon, growing with *Puccinellia phryganodes*). First report: Churchill [Størmer, 1933].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to s. Ellesmereland), n. Que., n. Lab., and Nfld., s. along the coast to Oreg., James Bay, and Me.; Greenland; Iceland; Spitsbergen; n. Eurasia.

6. **S. crassifolia** Ehrh.

Specimens have been seen from the following localities: Brandon, springy marsh (Macoun, 1896); Carberry, about 25 miles east of Brandon (Macoun & Herriot, 1906); Fort Ellice, about 70 miles northwest of Brandon (Macoun & Herriot, 1906); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, muddy edge of pool (Scoggan, 1949); York

Factory (McTavish, 1853; Bell, 1880, low damp places; Scoggan, 1949, alluvial soil); Churchill (Polunin, 1934; Buller, 1939; Gillett, 1948). First report: Jackson *et al.* [1922]. Probable basis of the citation of *S. gracilis* Richards. from near York Factory by Richardson ["H", in Franklin, 1823].

Arctic circumpolar: n. coast of Alaska, Yukon, and nw. Mack., Victoria I., s. Baffin I., n. Que., n. Lab., and Nfld., s. to Calif., Colo., N.D., Minn., and P.E.I.; Iceland; Eurasia.

7. **S. calycantha** (Ledeb.) Bongard (*S. borealis* Bigel.)

Damp to wet ground, shores, and rock outcrops throughout the province, except the northeastern barren grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet black spruce woods (Baldwin, 1951). Earliest collection seen: York Factory (McTavish, 1854). First report: York Factory [Bell, 1881].

(Arctic-)subarctic circumpolar: Seward Pen., Alaska, Mack. R. Delta, and Great Bear L. to s. Keewatin, n. Lab., and Nfld., s. to Oreg., Colo., and n. N.Y.; southern half of Greenland; Iceland; Eurasia. A map of the greater part of the American distribution of the collective species is given by Raup [1947, pl. XXIII].

7a. **S. calycantha** var. **isophylla** Fern.

A specimen has been seen only from Turtle Mountain, where it was collected by the writer in a damp aspen grove in 1950. First report: the present publication; but assigned to Manitoba in the range given by Fernald [1950].

Subarctic American: Alaska to Nfld., s. to Calif., Colo., Minn., and Pa.

7b. **S. calycantha** var. **floribunda** Fern.

Specimens have been seen from the following localities: Riding Mountain (Rowe, 1948); Swan River, north of Duck Mountain (Groh, 1922); Reindeer Lake, lat. 57° 37′ N., black spruce woods (Baldwin, 1951); Cochrane River, lat. 58° 38′ N., grassy meadow (Baldwin, 1951). First report: Cochrane River and Reindeer Lake [Baldwin, 1953].

(Subarctic-)temperate American: B.C. to n. Man. and Nfld., s. to Oreg., Ariz., Minn., and Pa.

8. **S. alsine** Grimm (*S. uliginosa* Murr.)

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, damp humus near ditch (Schofield, 1950); Churchill (Beckett, 1953). First report: York Factory [Bell, 1881].

(Subarctic-)temperate ?circumpolar: B.C.; n. Man.; Que. and Nfld. to Md.; Ga.; Eurasia.

9. S. GRAMINEA L. Common Stitchwort

Specimens have been seen from the following localities: The Pas, damp field (Krivda, 1949); Churchill (Gillett, 1948). First report: Morden and Roseisle [Lowe, 1943].

European: widely naturalized in North America.

10. **S. longifolia** Muhl.

Damp thickets, meadows, and shores throughout the province except the extreme north. Northernmost collection: Cochrane River, lat 58° 13′ N., grassy point, old campsite (Baldwin, 1951). Earliest collection seen: York Factory (McTavish, 1853). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg, damp thicket [Dawson, 1875].

Subarctic circumpolar: central Alaska to n. Man., James Bay, s. Lab., and Nfld., s. to Calif., Ariz., La., and S.C.; Eurasia.

Boivin [Svensk Botanisk Tidskrift 47: 43-46. 1953] has segregated the Manitoba plant into two entities, assigning to the one with generally shorter measurements of floral organs the name *S. atrata* (Moore) Boivin (*S. longifolia* var. *atrata* Moore, Rhodora 52: 56. 1950).

10a. **S. longifolia** var. **atrata** Moore

Known in the province only from Churchill, where it was collected by Eva Beckett in 1948. First report: Churchill [Boivin, in the above-cited paper].

Probably the range of the main form as here treated.

### 5. CERASTIUM L.

### (Mouse-ear Chickweed)

1. Plants annual, the stem lax and weak, viscid-hairy, without persistent leafy offshoots; leaves thin, acute or acutish; pedicels filiform, in fruit 1-5·5 cm. long and often abruptly bent or recurved near summit; inflorescence loose; sepals 2-5·5 mm. long, oblong-lanceolate, thin, blunt, shorter than the petals; seeds minutely roughened.
    2. Stems usually simple and less than 2·5 dm. high, their leaves 1-3·5 cm. long; sepals 3-4·5 mm. long; capsule nearly 3 times as long as the calyx............1. *C. nutans*
    2. Stems often branched from base and up to 5 dm. high, their leaves 2-5 cm. long; sepals usually 4.5-5 mm. long; capsule about twice as long as the calyx.....................................................*C. nutans* var. *occidentale*
1. Plants perennial, the stems matted and with depressed basal leafy offshoots; leaves firmer; pedicels straight or rather uniformly curved; seeds tuberculate.
    3. Petals narrow, about equalling the sepals, these 4-7 mm. long; bracts of the inflorescence mostly with broad scarious margins; pedicels 2-4 times the length of the calyx; seeds 0·5-0·7 mm. in diameter; basal offshoots herbaceous, with few or no axillary tufts; leaves oblong to narrowly oval, hirsute on both surfaces............2. *C. vulgatum*
    3. Petals broad, 2-3 times as long as the sepals.
        4. Bracts of the inflorescence mostly with broad scarious margins; petals 2-3 times as long as the calyx, the broad lobes spreading in anthesis; sepals 4·5-8·5 mm. long; leaves linear-subulate to narrowly ovate, acute, glabrous or velvety, those of the basal offshoots conspicuously tufted and persistent when dry.
            5. Internodes with reflexed non-glandular hairs......................3. *C. arvense*
            5. Internodes glandular-hispid......................3a. *C. arvense* var. *viscidulum*
        4. Bracts of the inflorescence mostly herbaceous and without scarious margins; petals about twice the length of the calyx, the lobes ascending; sepals 5·5-10 mm. long; leaves lanceolate to oval or oblong, obtusish, silky-hairy.
            6. Stem and pedicels hirsute but not glandular at summit..........4. *C. alpinum*
            6. Stem and pedicels glandular at summit.......4a. *C. alpinum* var. *glanduliferum*

1. **C. nutans** Raf. (*C. longipedunculatum* Muhl.; incl. var. *occidentale* Boivin)

Thickets, sandy prairie, rock outcrops, shores, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railway yard (Schofield, 1950). Earliest collection seen: Portage la Prairie (Macoun & Herriot, 1906). First report: Dufferin, Turtle Mountain, and Pembina Mountain [Dawson, 1875].

Temperate American: B.C. to sw. Que., s. to Ariz., Tex., and Fla.

2. C. VULGATUM L. (*C. triviale* Link) Common Mouse-ear Chickweed

Clearings and waste places in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Swan River, north of Duck Mountain (Groh, 1922). First report: Jackson *et al.* [1922].

Eurasian: widely naturalized in North America.

3. **C. arvense** L. (Incl. *C. campestre* Greene) Field-Chickweed

Prairie habitats and waste ground in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Dufferin, near Carman about 45 miles southwest of Winnipeg (Burgess, 1873). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

(Arctic-)subarctic circumpolar: sw. Alaska, Mack. R. Delta, and Great Bear L. to n. Alta., n. Que., n. Lab., and Nfld., s. to Calif. and Ga.; sw. Greenland; Eurasia.

3a. **C. arvense** var. **viscidulum** Gremli

Similar habitat and distribution as the main form. Northernmost collection: York Factory (McTavish, 1853 or 1854). Earliest collection seen: the foregoing York Factory specimen. First report: the present publication.

About the range of the main form.

4. **C. alpinum** L.

Known in the province only from Churchill, the earliest collection seen from that station being one made by Bell in 1879. First report: "Coast between York Factory and Churchill, and in the neighbourhood of Churchill" [Rae, 1850].

Arctic ?circumpolar (replaced in northwestern North America by *C. beeringianum*): ne. coast of Mack. to n. Ellesmereland, n. Lab., and Nfld., s. to Lake Superior and James Bay; Greenland; Iceland; n. Eurasia.

4a. **C. alpinum** var. **glanduliferum** Koch

Known in the province only from Churchill, where it was first collected in 1930 (name of collector not stated). First report: the present publication.

About the range of the main form.

## 6. Dianthus L.

1. D. barbatus L. Sweet William

The following specimens have been seen: north end of Lake Winnipegosis, clearing by old stables at East Mossy Portage (Scoggan, 1948); Morden, about 60 miles southwest of Winnipeg, thicket near waste heap (Scoggan, 1953). First report: the present publication.

European: spread from cultivation in North America.

## 7. Agrostemma L.

1. A. githago L. Purple Cockle

Specimens have been seen from the following localities: Fort Garry (Schultz, 1860); Teulon, about 30 miles north of Winnipeg (Lange, 1945); Grindstone Point, Lake Winnipeg, north of Hecla Island, wheat-field (Macoun, 1884); Brandon, wheat-field (Macoun, 1896). First report: Fort Garry [Schultz, 1861].

European: widely established in grain-fields of the United States and adjacent Canada.

## 8. Lychnis L.

### (Campion)

[*See* Porsild, 1943, pp. 31-37; Maguire, Rhodora 52: 233-243. 1950.]

1. Stem-leaves 5 pairs or more, the principal ones up to 4 cm. broad; flowers numerous; calyx inflated; stem freely forking; plant of the southern half of the province. . 1. *L. alba*
1. Stem-leaves 4 pairs or fewer, the principal ones 0·5-1·5 cm. broad, chiefly in a basal rosette; stems strict, the inflorescence wand-like.
  2. Calyx closely investing the capsule; flowers 1-9, on erect pedicels, their petals included or barely exserted; plant of the southern regions. . . . . . . . . . . . . . . . . . 2. *L. drummondii*
  2. Calyx somewhat inflated; flowers 1-few; plants of the Hudson Bay region.
    3. Flowers nodding in anthesis, their petals included or barely exserted; mature calyx usually conspicuously inflated. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3. *L. apetala*
    3. Flowers erect in anthesis, their petals conspicuously exserted; mature calyx less inflated. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4. *L. affinis*

1. L. alba Mill. (*Melandrium album* (Mill.) Garcke) White Cockle

Specimens have been seen from the following localities: Marchand, about 40 miles southeast of Winnipeg, roadside (Breitung, 1949); Winnipeg (Neatby & Peterson, 1929); Birds Hill, near Winnipeg, thicket (Scoggan, 1951); The Pas, by lane (Krivda, 1951). First report: Lowe [1943].

Eurasian: widely naturalized in North America.

2. **L. drummondii** Wats. (*Wahlbergella drummondii* (Hook.) Rydb.; *Melandrium drummondii* (Wats.) Porsild)

Dry prairie and clearings of southern Manitoba. Northernmost collection: Millwood, about 85 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Garry, dry gravelly soil (Macoun, 1872). First report: Burman [1910].

Temperate western American: B.C. to s. Man., s. to Ariz., N.M., and Neb.

3. **L. apetala** L. (*Melandrium apetalum* (L.) Fenzl; *Wahlbergella apetala* (L.) Fries)

Specimens have been seen only from Churchill, the first collections seen from that station being made by Porsild and Gardner in 1930. The species is also reported from York Factory by Bell [1881]. First report: Churchill River [Bell, 1880].

Arctic circumpolar (incl. ssp. *arcticum* (Fr.) Hult.): n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., and n. Lab., s. to Utah, Colo., and James Bay; northern half of Greenland; Spitsbergen; n. Eurasia. A map of the greater part of the American area is given by Raup [1947, pl. XXIV].

*L. apetala* var. *elatior* Regel is reported from Churchill (Macoun, No. 79078, 1910) by Maguire [Rhodora 52: 240. 1950] under the name of *L. furcata* ssp. *elatior*. However, in view of the fact that its chief diagnostic characters overlap those of the main form, and that *L. furcata* is treated by many authors as synonymous with the following species, it seems advisable to exclude this entity from our flora.

4. **L. affinis** J. Vahl (*L. furcata* of Am. auth., not *Viscago furcata* Raf.; *L. gillettii* Boivin; *Melandrium affine* (J. Vahl) Hartm.) [*See* Porsild, 1943, p. 33].

Known in the province only from Churchill, where it was first collected in crevices of rocks by Bell in 1884. First report: "Shore of Hudson's Bay at York Factory and Fort Churchill" [Bell, 1884].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., and n. Lab., s. to s. Alta., n. James Bay, and north-central Lab.; Greenland; Spitsbergen; n. Eurasia.

## 9. SILENE L.

### (Catchfly. Campion)

[*See* Hitchcock and Maguire, 1947.]

1. Calyx pubescent and glandular.
   2. Plant annual, up to 6 (rarely 8) dm. high; leaves ovate-lanceolate, hirsute to short-pubescent, mostly 5-10 cm. long, the lower ones spatulate, the upper ones more or less lanceolate; flowering calyx about 1·5 cm. long, becoming 2·5 cm. long or more in fruit........................................................1. *S. noctiflora*
   2. Plant perennial from slender rootstocks, mostly 5-20 cm. high; leaves lanceolate or elliptic to oblanceolate, mostly 2-6 cm. long, usually acuminate, minutely hairy, those of the inflorescence scarcely reduced; calyx 5-8 mm. long............2. *S. menziesii*
1. Calyx glabrous.
   3. Stems slender, the upper part with usually dark glutinous bands below the nodes, its slender branches and those of the panicle usually ascending; stem-leaves mostly lanceolate to oblanceolate, 3-6 cm. long, the margins ciliate near the base; calyx 4-8 mm. long, its short teeth often purple; plant annual.....................3. *S. antirrhina*
   3. Stems relatively stout, without glutinous bands; plants perennial or biennial from creeping rootstocks.
      4. Calyx much inflated, up to 2 cm. long in fruit, its summit free of the short-stalked included capsule, its 20 nerves connected their entire length by a network of veinlets; inflorescence open.........................................4. *S. cucubalus*
      4. Calyx uninflated at maturity, 7-12 mm. long, its summit appressed to the subsessile exserted capsule, 20-nerved at base, 10 nerved above, the veinlets hardly forming a network; inflorescence simple and elongate or with 2 erect slender branches ..............................................................5. *S. cserei*

1. S. NOCTIFLORA L. Night-flowering Catchfly

Roadsides and clearings in the southern half of the province. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: Brandon, streets (Macoun, 1896). First report: Burman [1910].

European: widely naturalized in North America.

2. **S. menziesii** Hook. [*See* Rydberg, 1932, p. 325]

Known in Manitoba only from The Pas, where it was collected in 1950 and 1951 by W. Krivda along roadsides and a dry gravel railway embankment. First report: "At a salt spring near the mouth of Red Deer River, at the head of Lake Winnipegoosis" [Macoun, 1883].

Subarctic western American: sw. Alaska and south-central Yukon to central Man., s. to Calif., N.M., S.D., and Mo.

3. **S. antirrhina** L. Sleepy Catchfly

Dry, sandy or gravelly soil and rock outcrops in the southern two-fifths of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, gravel ridge (Scoggan, 1948). Earliest collection seen: Elk Island, near the south end of Lake Winnipeg, rocks and sandy soil (Macoun, 1884). First report: "Winnipeg and N.W. Angle Road" [Dawson, 1875].

Temperate American: B.C. to sw. Que., s. to Mexico and S. Am.; adventive in Europe.

4. S. CUCUBALUS Wibel (*S. latifolia* (Mill.) Britten & Rendle; *S. vulgaris* (Moench) Garcke; *S. inflata* Sm.) Bladder-Campion

Dry clearings of southern Manitoba. Northernmost collection: Duck Mountain, sandy roadside (Pike, 1948). Earliest collection seen: Strathclair, about 40 miles north-northwest of Brandon (Clever, 1924). First report: Strathclair [Lowe, 1943].

Eurasian: widely naturalized in North America.

5. S. CSEREI Baumg.

Specimens have been seen from the following localities: Winnipeg (Fowler, 1939; Denike, 1940; Bourns, 1949; Frankton, 1949, heavy clay and cinders of railway); Pine Ridge, near Winnipeg (Boivin and A. & D. Löve, 1951); Brokenhead, about 30 miles northeast of Winnipeg (A. & D. Löve, 1951); Virden, about 45 miles west of Brandon, railroad ballast (Scoggan, 1953). First report: "Manitoba" [Groh & Frankton, 1949].

European: widely naturalized in the northern United States, and spreading into western Canada.

*S. acaulis* L., Moss-Campion, a species of arctic America and Europe, is reported by Rae [1850] from between York Factory and Churchill, but there is otherwise no indication of its occurrence in the province.

### 10. GYPSOPHILA L.

1. G. PANICULATA L. Baby's-breath

Specimens have been seen from the following localities: Emerson, south of Winnipeg near the International Boundary (Fowler, 1887); Melita, about 60 miles southwest of Brandon, roadside (Scoggan, 1953); Wawanesa, about 20 miles southeast of Brandon, near garden (Scoggan, 1953); Brandon, prairie "blowout" near garden (Scoggan, 1953); Rossburn, about 70 miles northwest of Brandon, prairie slope (Scoggan, 1951). First report: "Introduced at Emerson" [Macoun, 1890].

Eurasian: locally spread from cultivation in North America.

### 11. SAPONARIA L.

1. S. VACCARIA L. (*Vaccaria vulgaris* Host; *V. segetalis* (Neck.) Garcke) Cow-Cockle

Grain fields and waste places in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railroad ballast (Schofield, 1950). Earliest collection seen: Deloraine, near Turtle Mountain (Fletcher, 1896). First report: Carberry, oat-field [Christy, 1887].

European: widely naturalized in North America, and a frequent weed in grain-fields.

### ***Paronychia*** Mill.

(Whitlow-wort)

*P. depressa* Nutt. is cited by Jackson *et al.* [1922] from Victoria Beach, and Manitoba is included in the range of the species given by Rydberg [1932]. No specimens have been seen, however, and it should be excluded from our flora for the present. A so-named specimen from Grand Beach (Jackson, undated) was found to be referable to *Suaeda depressa*.

*P. sessiliflora* Nutt. is listed by Burman [1910] without locality, and is accredited to southwestern Manitoba by Jackson *et al.* [1922] and Lowe [1943]. Manitoba is included in the range given by Rydberg [1932]. Macoun [1886] cites it on "Dry gravelly ridges from Fort Ellice westward to Morley" (Alberta). No Manitoba specimens have been seen, however, and the species should be excluded from our flora for the present.

## 43. CERATOPHYLLACEAE

(Hornwort Family)

### 1. CERATOPHYLLUM L.

(Hornwort)

1. **C. demersum** L.

Shallow water in the southern half of the province. Northernmost collection: Oxford Lake, shallow water (Scoggan, 1949). Earliest collection seen: Lake Winnipegosis, "ponds, lakes and slow streams" (Macoun, 1881). First report: Wilkins Point, Dawson Bay, Lake Winnipegosis [Macoun, 1886].

(Subarctic-)temperate American: B.C. to n. Alta., central Man., and N.S., s. to Calif., Tex., and Fla.; Mexico; Central America. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Fassett [Comun. Inst. Trop. Investig. Cientif., No. 2, p. 43, 1953].

## 44. NYMPHAEACEAE

### (Water-lily Family)

1. Leaves entire, attached to petioles near the centre of the under surface (peltate); flowers dull purple........................................................*Brasenia*
1. Leaves with a basal sinus at the junction of petiole and midrib.
    2. Petals white, large and showy, passing gradually into sepals and stamens; sepals 4, green or purplish outside; flowers widely expanding before closing; fruit often surrounded by the bases of decayed petals; veins of leaves mostly radiating from summit of petiole........................................................1. *Nymphaea*
    2. Petals small, thick and stamen-like; flowers subglobose, with 5 or more concave, yellow or greenish-yellow sepals; fruit naked except at base; veins of leaves forking from midrib........................................................2. *Nuphar*

## 1. Nymphaea L.

### (Water-lily)

1. Leaves orbicular to round-reniform, with narrow sinus; flowers very fragrant, with 17-32 white petals and 36-100 stamens; fruit closely covered by the perianth; rhizome horizontal and forking........................................................1. *N. odorata*
1. Leaves broadly ovate to obvate, with a V-shaped sinus; flowers odourless, with 8-17 petals and 12-40 stamens; fruit naked, the sepals becoming stiffly erect; rhizome erect and unbranched........................................................2. *N. tetragona* ssp. *leibergii*

1. **N. odorata** Ait. (Incl. var. *minor* Sims.) Fragrant Water-lily

Specimens have been seen from the following localities: Whiteshell Forest Reserve, ponds and lakes (Lowe, 1920; Simpson, 1934; Scoggan, 1951); Minago River near Hill Lake, north of Lake Winnipeg (Scoggan, 1948). First report: Burman [1910].

(Subarctic-)temperate eastern American: Man. to Nfld., s. to La. and Fla.

2. **N. tetragona** Georgi subsp. **leibergii** (Morong) Porsild [*See* Porsild, Can. Field-Nat. 53: 48-50. 1939].

Specimens have been seen from the following localities: Rennie, east of Winnipeg near the Ontario boundary (W. & N. Elder, 1952); Inwood, about 40 miles north-northwest of Winnipeg (Dudley, 1929); Drunken Lake, about 45 miles north of Lake Winnipeg (Scoggan, 1948). First report: Inwood [Lowe, 1943].

Subarctic American: sw. Alaska to Great Slave L., central Man., James Bay, and e. Que., s., locally, to Wash., Ida., n. Minn., n. Mich., and Me.; the main form Eurasian. A map of the area of the collective species is given by Raymond [1950, fig. 18].

## 2. NUPHAR Sm.

## (Yellow Pond-lily)

1. Floating leaves 3·5-10 cm. long, with a narrowly V-shaped sinus; flowers 1·5-3 cm. broad; fruit globose, with a short neck, without a ring of decaying stamens at base, its red disk 6-10-rayed........................................1. *N. microphyllum*
1. Floating leaves 7-35 cm. long, with a closed or usually narrow sinus, the basal lobes broadly rounded; flowers 5-11 cm. broad when laid open; fruit constricted above, the green or yellowish disk 7-25-rayed, the young fruit with a ring of decaying stamens at base........................................2. *N. variegatum*

1. **N. microphyllum** (Pers.) Fern. (*Nymphozanthus microphyllus* (Pers.) Fern.)

Ponds and lakes in the southern half of the province. Northernmost collection: Cranberry Portage, about 45 miles southeast of Flin Flon (Freedman, 1950). Earliest collection seen: Punk Island, northeast of Hecla Island, Lake Winnipeg (Macoun, 1884). First report: Waugh, Lake Brereton, and Steeprock [Lowe, 1943]. Basis of the report of *Nuphar luteum* from Punk Island by Macoun [1886], and of *N. pumilum* from the province by Burman [1910].

(Subarctic-)temperate eastern American: central Man. to Nfld., s. to Minn. and N.J.

2. **N. variegatum** Engelm. (*Nymphozanthus variegatus* (Engelm.) Fern.)

Ponds, lakes, and quiet streams in the southern four-fifths of the province. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., bay (Baldwin, 1951). Earliest collection seen: Selkirk, ponds and slow streams (Macoun, 1884). First report: Scoggan [1950]; basis of reports of *N. advena* (*Nymphaea advena*) from the province.

Subarctic American: n. Mack. to n. Man., Lab., and Nfld., s. to Mont., S.D., Neb., and Del.

### ***Brasenia*** Schreb.

*B. schreberi* Gmel., Water-shield: Manitoba is included in the range assigned this species by Rydberg [1932], and it is included, on this basis, in the checklist of Lowe [1943]. Until specimens are available, however, it must be excluded from the flora of the province.

## 45. RANUNCULACEAE

## (Crowfoot Family)

1. Plant a vine, climbing by the bending of the petioles; leaves opposite, compound; styles persistent, elongated and plumose........................................1. *Clematis*
1. Plant herbaceous, not climbing.
    2. Flowers spurred.
        3. Leaves basal, entire, linear-spatulate; scapes 1-flowered, the 5 sepals long-spurred at base, the floral axis becoming greatly elongated, in fruit up to 5 cm. long........................................2. *Myosurus*
        3. Leaves cauline, deeply lobed and toothed.
            4. Spur at base of petals; flowers regular, terminating the branches; leaves 2-3-ternately compound........................................3. *Aquilegia*
            4. Spur at base of upper sepal, enclosing spurs of the two upper petals; flowers irregular, in terminal racemes; leaves palmately divided..........4. *Delphinium*

2. Flowers without spurs, regular.
    5. Fruit red or white, berry-like; flowers in a terminal raceme, small, the petals with slender claws at base; leaves 2-3-ternately compound..................5. *Actaea*
    5. Fruit not berry-like.
        6. Fruit consisting of follicles (pods splitting down one side).
            7. Leaves basal, evergreen, the 3 leaflets lustrous and sharply toothed, cuneate-obovate; scape slender, 7-13 cm. high, 1-flowered; follicles long-stalked, with slender beaks 2·5-4 mm. long; rhizomes filiform, bright yellow.......6. *Coptis*
            7. Leaves simple, orbicular to reniform, subentire or dentate, at least some of them borne on the stem; follicles sessile, short-beaked; roots fibrous...............................................................7. *Caltha*
        6. Fruit consisting of numerous achenes on a rounded or elongated central axis.
            8. Leaves basal (except for an involucre of 3 small sessile oblong leaves immediately below the flowers), on long hairy petioles, 3-lobed, the lobes rounded at summit; flowers single on hairy scapes.................................8. *Hepatica*
            8. Leaves, at least some of them, borne on the stem.
                9. Stem-leaves opposite or whorled, forming an involucre at the base of the long peduncles; leaves deeply lobed or finely dissected..........9. *Anemone*
                9. Stem-leaves alternate.
                    10. Leaves 3-4-ternately compound; flowers small and very numerous, in panicles, the petals wanting, the sepals petal-like or greenish, usually soon deciduous; plants dioecious or polygamous.........10. *Thalictrum*
                    10. Leaves simple, toothed (rarely entire) to deeply lobed or finely dissected; petals regularly present, white or yellow; flowers perfect.......................................................................11. *Ranunculus*

## 1. CLEMATIS L.

### (Clematis)

1. Flowers solitary on long peduncles, purplish-blue, the 4 thin, strongly nerved sepals up to 5 cm. long; mature plumose styles about 5 cm. long; leaflets 3, irregularly few-toothed or lobed, or entire...........................................*Clematis verticillaris*
1. Flowers numerous in compound panicles, the whitish sepals 6-12 mm. long; mature plumose styles about 3 cm. long; leaflets incisely few-toothed and somewhat lobed.
    2. Leaves with 3 leaflets, or the lower rarely with 5...................1. *C. virginiana*
    2. Leaves with 5-7 leaflets, or the lower ones sometimes more divided.................................................................................*C. ligusticifolia*

### 1. **C. virginiana** L. Virgin's-bower

Specimens have been seen from the following localities: Whiteshell Forest Reserve east of Winnipeg (McMillan, 1948); Roseau River Indian Reserve south of Winnipeg (A. & D. Löve, 1953); Brandon (Groh, 1922; distributed as *C. ligusticifolia*, but the single specimen seen appears referable here); Dropmore, northwest of Riding Mountain (Sparling, 1933). First report: "disappearing about the south end of Lake Winnipeg" [Hooker, 1829].

Temperate eastern American: s. Man. to e. Que., s. to e. Kans., La., and Ga.

*C. verticillaris* DC. (*Atragene americana* Sims.), Purple Clematis, is reported from the province by Jackson *et al.* [1922] and Lowe [1943], but no specimens have been seen, and it should be excluded from our flora for the present.

### 2. MYOSURUS L.

### (Mousetail)

1. **M. minimus** L. (Incl. var. *interior* Boivin; *M. shortii* Raf.)

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg, low ground (Neatby, 1927); Crystal City, east of Turtle Mountain (Thomas, 1938); Deloraine, north of Turtle Mountain, alkaline flat (Scoggan, 1953); old Souris River channel south of Melita, alkaline flat (Lowe, 1935). First report: near Short Creek, Souris River [Dawson, 1875].

Temperate amphi-Atlantic: Sask. to s. Ont., Ill., and Va., s. to Tex. and Fla.; Europe.

The American plant has been segregated as var. *interior* by Boivin [Div. of Bot. and Pl. Path., Sci. Serv., Ottawa, Contrib. 1197: 331. 1952], who ascribes to it a sepal-spur length of 2·0-2·5 mm., in contrast to 1·0-1·5 mm. for the European plant. The Deloraine plant cited above, however, had spurs only 0·8-1 mm. long, exactly matching European specimens in the National Herbarium of Canada, so that such segregation appears unwarranted.

### 3. AQUILEGIA L.

### (Columbine)

1. Spurs strongly hooked; petals blue or purple; follicles tipped by styles only 2-5 mm. long . . . . . . . . . . . . . . . . . . . 1. *A. brevistyla*
1. Spurs straight, their tips merely oblique; petals scarlet or bright red, yellow within; mature styles 1·5-2 cm. long . . . . . . . . . . . . 2. *A. canadensis*

1. **A. brevistyla** Hook.

Woods, thickets, and clearings almost throughout the province except the extreme north. Northernmost collection: Churchill River, between Missi Falls and the mouth of Little Churchill River (Cairnes, 1915). Earliest collection seen: the foregoing Churchill River specimen. First report: Riding Mountain [Halliday, 1935].

Subarctic western American: central Alaska, Mack. R. Delta, Great Bear L., and n. Man., s. to central B.C., s. Alta., S.D., and Minn. A map of the area is given by Raup [1947, pl. XXIV].

2. **A. canadensis** L. (Incl. var. *hybrida* of auth., not Hook.; var. *eminens* (Greene) Boivin)

Woods, thickets, and clearings in the southern third of the province. Northernmost collection: Porcupine Mountain, clearing (Scoggan & Baldwin 1950). Earliest collection seen: "L. Winnipeg Valley" (Bourgeau, 1857; specimen in Gray Herbarium of Harvard University). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg [Dawson, 1875]. Basis of reports of *A. coccinea* Small from Otterburn and Brandon by J. M. Macoun [1902] and of *A. latiuscula* Greene from several localities by Lowe [1943]. The citation "Oxford House to Knee Lake" by Bell [1881] is probably referable to the foregoing species. The Manitoba plant is probably var. *eminens* (Greene) Boivin, of which the two following specimens are cited (as var. *hybrida*) by Munz [Gentes Herbarum 7: 122. 1946]: Portage la Prairie (Macoun & Herriot, No. 69776, 1906); Fort Ellice (Macoun & Herriot, No. 69777, 1906).

Temperate eastern American (the collective species): Man. to e. Que., s. to Tex. and Ga.; reported from Sask.

According to a recent note by Boivin [Amer. Midland Nat. 50: 509-510. 1955], the type of var. *hybrida* Hook. is a characteristic specimen of *A. brevistyla* Hook.

### 4. DELPHINIUM L.

### (Larkspur)

1. Leaves cauline, finely dissected into narrowly linear or filiform segments; pistil solitary; petals 2, united below; annual........1. *D. ajacis*
1. Leaves chiefly basal or below middle of stem, with broader segments; pistils 3; petals 4, distinct; perennial........2. *D. virescens*

1. D. AJACIS L. Rocket-Larkspur

Specimens have been seen from the following localities: Winnipeg, roadside near garden (D. Löve, 1951); Dauphin, north of Riding Mountain, waste ground (Scoggan, 1953). First report: the present publication.

European: naturalized in the United States and adjacent Canada, partly spread from cultivation.

2. **D. virescens** Nutt.

The following specimens were seen in the Gray Herbarium of Harvard University: "L. Winipeg Valley" (Bourgeau, 1859); Winnipeg (Houghton, undated). First report: Netley Marsh at the south end of Lake Winnipeg [Jackson *et al.*, 1922]. Basis of the report of a variety of *D. azureum* from Lake Winnipeg by Bourgeau [in Palliser, 1863; *see* Ewan, Univ. Colo. Studies, Ser. D, 2: 167. 1945].

Temperate (interior) American: s. Man. to Wisc., s. to Tex., Okla., and Mo.

### 5. ACTAEA L.

### (Baneberry)

1. Mature pedicels filiform; fruit red (or white in f. *neglecta*), the capping stigma relatively small and inconspicuous........1. *A. rubra*
1. Mature pedicels stout and almost or quite as thick as the central axis, usually red; fruit white, capped by a red or purple, broad, sessile stigma........*A. pachypoda*

1. **A. rubra** (Ait.) Willd. (*A. spicata* var. *rubra* Ait.) Red Baneberry. Snakeberry

Woods and thickets in the southern three-quarters of the province. Northernmost collection seen: York Factory, white spruce woods (Scoggan, 1949). Earliest collection seen: Doghead Point, near The Narrows, Lake Winnipeg, rich woods (Macoun, 1884). First report: Churchill River [Bell, 1880].

Subarctic American: central Alaska and central Yukon to Great Slave L., n. Man., James Bay, s. Lab., and Nfld., s. to Ariz., S.D., and N.J. A map of the northern part of the distribution, on which the occurrence of the species in Manitoba north to York Factory should be indicated, is given by Raup [1947, pl. XXIV].

Forma *neglecta* (Gillman) Robins. (*A. eburnea* Rydb.; *A. alba* sensu Rydberg, not Mill.), with ivory-white fruits, is common throughout the Manitoba area.

*A. pachypoda* Ell. (*A. alba* sensu Gleason, not Mill.; *A "brachypoda"* Ell.), white Baneberry or Doll's-eyes, is cited from Churchill by Lowe [1943], and Manitoba is included in the range given by Fernald [1950]. No specimens have been seen, however, and in view of the former confusion of names [*see* Fernald, Rhodora 42: 260-264. 1940; Gleason, Rhodora 46: 146-148. 1944], it seems best to exclude it from our flora for the present.

## 6. Coptis Salisb.

## (Goldthread)

1. **C. trifolia** (L.) Salisb. var. **groenlandica** (Oeder) Fassett (*C. groenlandica* (Oeder) Fern.; *C. trifolia* ssp. *groenlandica* (Oeder) Hult.) [*See* Fernald, Rhodora 31: 136-142. 1929; Hultén, 1943, pp. 715-716; Fassett, Trans. Wisc. Acad. Sci. 38: 195. 1946].

Mossy woods, muskeg, and tundra throughout the province, except the southern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Red River Valley, low ground (Burgess, 1873). First report: "Manitoba" [Fernald, Rhodora 31: 136. 1929].

(Arctic-)subarctic eastern American: L. Athabaska to s. Keewatin, n. Que., and Nfld., s. to n. Ia., Tenn., and N.C.; s. Greenland; the main form is a plant of northwestern North America and Asia.

## 7. Caltha L.

## (Marsh-Marigold)

1. Flowers bright yellow or orange, 2·5-3·5 cm. broad; follicles few, 1-1·5 cm. long; leaves dentate, up to 2 dm. broad or more; stem stout, hollow, erect or decumbent.............. ..........................................................1. *C. palustris*
1. Flowers white or pinkish, 1-1·2 cm. broad; follicles numerous, 3-4 mm. long, in a globose head; leaves thin, subentire, mostly less than 5 cm. broad; stem floating or creeping in wet places, rooting at the nodes......................................2. *C. natans*

1. **C. palustris** L.

Swamps, wet meadows, and wet woods throughout the province except the extreme north. Northernmost collection: Churchill (Beckett, 1948). Earliest collection seen: "Head of Lake Winnipeg, swamps and marshy meadows" (Bell, 1879). First report: "Winnipeg and N.W. Angle Road" and "Swamps at base Pembina Mountain" [Dawson, 1875]. Some of the northern Manitoba material appears referable to the barely distinct var. *arctica* (R. Br.) Huth., with more open leaf-sinuses and more radicant growth.

Arctic circumpolar (the collective species): n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (var. *arctica*; n. to Melville I.), n. Man., Lab., and Nfld., s. to Vancouver I., s. Man., Neb., and S.C.; Eurasia.

2. **C. natans** Pall.

Specimens have been seen from the following localities: Sasaginnigak Lake, about 125 miles northeast of Winnipeg, shallow bay (Breitung, 1949); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, shallow pool (Scoggan, 1949); Reindeer Lake, lat. 57° 54′ N., creek (Baldwin, 1951). Reported also from Flin Flon and Berens River by Lowe [1943], but the Berens River citation is referable to *Ranunculus pallasii*. The Flin Flon specimen was not seen. First report: Snake Creek, Waugh, near the Ontario boundary east-southeast of Winnipeg [Jackson *et al.*, 1922].

Subarctic ?circumpolar: Seward Pen., Alaska, to Great Slave L. and s. Keewatin, s. to central Alta. and n. Minn.; gap in e. N. Am. and w. Europe; ne. Europe; n. Asia.

### 8. HEPATICA Mill.

### (Liverleaf. Hepatica)

1. **H. americana** (DC.) Ker

A single specimen has been seen from "Cartwright's Point", where it was collected in 1892 by I. K. McMorine. The specimen is in the herbarium of the Division of Botany, Department of Agriculture, Ottawa. First report: the present publication; but Manitoba is included in the range given by Fernald [1950]. Basis of the citation of *H. triloba* from Notre Dame de Lourdes, about 30 miles south-southwest of Portage la Prairie, by Lowe [1943]. A doubtful report of *Anemone hepatica* L. (*H. triloba* Gilib.) from Winnipeg River is noted by Macoun [1883], which, if substantiated, will probably prove referable to the present species.

Temperate eastern American: s. Man. to e. Que. and N.S., s. to Mo., Ala., and n. Fla. Closely related to the European *H. triloba* Gilib. (*H. nobilis* Schreb.), and perhaps not deserving specific segregation.

### 9. ANEMONE L.

### (Anemone)

1. Styles much elongating in fruit, plumose; flowers mostly solitary, the 5-7 blue, purple, or white sepals 1·5-4 cm. long; leaves and involucre deeply cleft into linear or narrowly lanceolate acute lobes; plant silky-villous ............... 1. *A. patens* var. *wolfgangiana*

1. Styles remaining short in fruit, not plumose.
  2. Achenes nearly glabrous or densely short-hirsute, not woolly.
    3. Achenes glabrous or nearly so, compressed, the beak about as long as the body; involucral leaves sessile.
      4. Flowers yellow, solitary, the peduncle subtended by 2 involucral leaves, these deeply 3-5-parted; achenes ovate-oblong, not winged, reflexed; plant of the Hudson Bay region ............................................ 2. *A. richardsonii*
      4. Flowers white, often two or more, the primary peduncle naked and subtended by an involucre of 3 cuneate-obovate, deeply 2-3-parted, coarsely toothed divisions, the other peduncles with 2 similar but smaller involucral leaves; achenes obovate to orbicular, broadly wing-margined, in a globose head ......... 3. *A. canadensis*
    3. Achenes densely short-hirsute, spindle-shaped, the beak shorter than the body; flowers solitary, whitish, their peduncles subtended by 3 long-petioled involucral leaves, these cuneate-obovate, deeply cut; stem spreading-villous above ........... ......................................... 4. *A. quinquefolia* var. *interior*

2. Achenes densely long-woolly, forming dense woolly heads.

5. Involucral leaves 2 or 3, sessile, with narrow blunt lobes; flower usually solitary, its 4-7 sepals white above, bluish and silky beneath at base; slender creeping rhizomes present; plant of the Hudson Bay and low-northern regions........5. *A. parviflora*

5. Involucral leaves petioled, their lobes and divisions acute or acutish; flowers mostly 2-many; creeping rhizomes absent.

6. Leaves dissected into numerous linear or narrowly lanceolate acuminate lobes; styles filiform, often deciduous in fruit.

7. Sepals 5-10 mm. long, yellowish-white within, yellowish, greenish, or purplish outside (or sepals bright red in f. *sanguinea*)................6. *A. multifida*

7. Sepals 1·1-1·7 cm. long, bright red (or milk-white in f. *leucantha*)........................................................6a. *A. multifida* var. *richardsiana*

6. Leaves with 3-5 broad-lobed oblanceolate or obovate divisions; styles awl-shaped, persistent in fruit.

8. Peduncles mostly naked; styles crimson; anthers 0·8-1·2 mm. long; fruiting head slender-cylindric, 2-4 cm. long; plant densely ashy-pubescent.....................................................................7. *A. cylindrica*

8. Peduncles themselves mostly with involucral leaves; styles pale or merely crimson-tipped; plants greener.

9. Anthers 0·7-1·2 mm. long; fruiting heads cylindric, 7-11 mm. thick; basal leaves sparingly pubescent, their divisions cuneate............8. *A. riparia*

9. Anthers 1·2-1·6 mm. long; fruiting heads ovoid or oval, 12-15 mm. thick; basal leaves more pubescent, their divisions often broader and less cuneate at base.............................................9. *A. virginiana*

1. **A. patens** L. var. **wolfgangiana** (Bess.) Koch (var. *nuttalliana* Gray; *Pulsatilla ludoviciana* Heller) [*See* Löve, Svensk Botanisk Tidskrift 48: 219-222. 1954.] Pasque-flower. Prairie-smoke

Common on dry prairie and hillsides of southern Manitoba, but extending locally northward to about lat. 55° N. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, portage through spruce woods (Scoggan, 1948). Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: Dufferin, Red River, and Turtle Mountain [Dawson, 1875]. Basis of reports of the main form from the province. Floral emblem of Manitoba.

Arctic ?circumpolar (large gaps in e. N. Am. and w. Europe): n. Alaska and n. coast of Yukon and w. Mack. to s. Banks I., s. to Wash., Utah, Tex., Mo., and n. Mich.; e. Russia; Asia. A map of the distribution is given by Löve [Svensk Botanisk Tidskrift 48: 221 (fig. 3). 1954].

2. **A. richardsonii** Hook.

Specimens have been seen from the following localities: York Factory, wet mossy ground (Bell, 1878); Churchill (several collections, the first seen being one made by McTavish in 1853). First report: near York Factory ["H", Richardson, in Franklin, 1823; as "*A. ranunculoides*? var.", referred by Hooker, 1829, to the present species].

Arctic American: n. coast of Alaska, Yukon, and Mack., Banks I., Victoria I., n. Que., and n. Lab., s. to s. Alta., nw. Sask., n. Man., and s. Hudson Bay; sw. Greenland; e. Asia. Maps of the distribution are given by Raup [1947, pl. XXIV] and Böcher [Journ. Ecol. 39: 387 (fig. 6). 1951].

3. **A. canadensis** L. (*A. pensylvanica* L.)

Woods, thickets, meadows, shores and clearings throughout the southern three-quarters of the province. Northernmost collection seen: York Factory, gravel beach of Hay Island (Scoggan, 1949); also reported from this locality by Bell [1881], but the specimen has not been seen. The species is also cited from Churchill River between Missi Falls and the mouth of Little Churchill River by Alcock [1916]. Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Fort Garry [Schultz, 1861]. Basis of the listing of the closely related *A. dichotoma* of Asia by Burman [1910].

(Subarctic-)temperate American: sw. Mack. to n. Man. and Anticosti I., s. to N.M., Mo., and N.J.

4. **A. quinquefolia** L. var. **interior** Fern. Wood-Anemone

Woods and thickets in the southern half of the province. Northernmost collection: 17 miles north of The Pas, "Patch 2 yards square, 17 Mile Beach" (Krivda, 1950). Earliest collection seen: Pembina Mountain, south of Portage la Prairie (Dawson, 1874). First report: "eastern Manitoba" [Fernald, Rhodora 37: 260. 1935]. Basis of reports of the main form and the closely related *A. nemorosa* of Europe from the province.

Temperate eastern American: central Man. to s. James Bay, s. to Ia. and Ky.

5. **A. parviflora** Michx.

Woods, thickets, and shores in the northern two-fifths of the province. Northernmost collection: Churchill (several collections, the first seen being that of Macoun in 1910). Southernmost collection: Hayes River at The Rock, about 100 miles southwest of York Factory, damp bank of stream (Scoggan, 1949). Earliest collection seen: the foregoing Churchill specimen. First report: Churchill River [Bell, 1880].

Arctic American: n. coast of Alaska, Yukon, and Mack., s. Banks I., Victoria I., n. Que., n. Lab., and Nfld., s. to Oreg., Ida., Colo., N.D., n. coast of Lake Superior, and e. Que.; e. Asia. A map of the greater part of the American distribution is given by Raup [1947, pl. XXIV].

6. **A. multifida** Poir. (var. *hudsoniana* DC.; *A. globosa* Nutt.)

Thickets, sandy prairie, rock outcrops, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Bell in 1884). Earliest collection seen: Rapid City, about 20 miles north of Brandon (Macoun, 1878). First report: Churchill and Nelson rivers [Bell, 1880].

Subarctic American: central Alaska and Great Bear L. to n. Man., James Bay, and Nfld., s. to Calif., N.M., S.D., n. Minn., and n. Vt.; S. Am.

Forma *sanguinea* (Pursh) Fern., with bright red sepals, is common throughout the Manitoba area.

6. **A. multifida** var. **richardsiana** Fern.

A single specimen, referred by Boivin to f. *leucantha* Fern. (sepals milk-white), has been seen from Churchill, where it was collected by MacKinnon in 1947. The specimen is in the herbarium of the Division of Botany, Dept. of Agric., Ottawa. First report: the present publication.

(Subarctic-)temperate American: Rocky Mts.; n. Man.; e. Que.; N.Y.

7. **A. cylindrica** Gray Thimbleweed

Thickets, dry prairie, and clearings in the southern two-thirds of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, clearing on limestone substratum (Scoggan, 1948). Earliest collection seen: Brandon, open prairie (Macoun, 1896). First report: Burman [1910].

Temperate American: B.C. to Que., s. to Ariz., N.M., Kans., Mo., and N.J.

8. **A. riparia** Fern. Thimbleweed

Thickets, woods, and clearings in the southern two-fifths of the province. Northernmost collection: The Pas, sandy river shore (Krivda, 1951). Earliest collection seen: Aweme, about 20 miles southeast of Brandon (Fletcher, 1904). First report: the present publication.

(Subarctic-)temperate American: s. B.C. to w. Nfld., s. to Minn., Ill., Mich., and N.E.

9. **A. virginiana** L. Thimbleweed

Thickets, woods, and clearings in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, clearing on limestone substratum (Scoggan, 1948). Earliest collection seen: Selkirk, about 20 miles northeast of Winnipeg, dry open woods (Macoun, 1884). First report: Fort Garry [Bourgeau, in Palliser, 1863].

Temperate eastern American: Man. to Me., s. to Kans., Ark., and Ga.

### 10. THALICTRUM L.

### (Meadow-Rue)

[*See* Boivin, 1944; 1948.]

1. Achenes strongly compressed, semi-obovate (asymmetrically "half-moon"-shaped), on stipes 1·2-3 mm. long; flowers perfect; anthers 0·5-1 mm. long; pedicels subtended by small but compound leaf-like bracts................1. *T. sparsiflorum* var. *richardsonii*

1. Achenes inflated, sessile or short-stalked; flowers mostly dioecious; pedicels bractless or subtended by minute simple bracts.

   2. Rhizome short and erect; leaflets firm, usually pubescent beneath, (0-)3(-5)-lobed, the lobes entire.............................................2. *T. dasycarpum*

   2. Rhizome horizontal and cord-like; leaflets glabrous, 3-5-lobed, the lobes mostly toothed.

3. Leaflets firm, strongly veined beneath, the veinlets forming small closed reticulations; anthers 2·5-3 mm. long, their terminal points 0·1-0·2 mm. long; stigmas 1-2·5 mm. long; body of achene 3-4 mm. long .................. 3. *T. venulosum*
3. Leaflets thinnish, the weak veinlets forming a coarse open network beneath; anthers 3-4·5 mm. long, their terminal points 0·5-1 mm. long; stigmas 2·5-4·5 mm. long; body of achene 4-6 mm. long .................................. 4. *T. confine*

### 1. **T. sparsiflorum** Turcz. var. **richardsonii** (Gray) Boivin

Specimens have been seen from the following localities: Porcupine Mountain, low rich alluvial soil (Macoun, 1881; determined by Boivin); Hayes River at The Rock, about 100 miles southwest of York Factory, aspen and white spruce woods (Scoggan, 1949); York Factory (McTavish, 1853-54; Scoggan, 1949, white spruce woods). First report: the present publication; basis of the citation of the main form from Porcupine Mountain by Macoun [1883].

Subarctic western American: central Alaska to n. Man., s. to B.C. and south-central Man.; Siberia.

### 2. **T. dasycarpum** Fisch. & Lall. Purple Meadow-Rue

Open woods, thickets, prairie, shores, and clearings throughout the southern half of the province, or possibly as far north as York Factory if the citation by Bell [1881] of the European *T. cornuti* L. from that locality is referable here. Northernmost collection seen: Hill Lake, north of Lake Winnipeg, limestone ledges near entry of Minago River (Scoggan, 1948). Earliest collection seen: High Bluff, near Portage la Prairie (Hargrave, 1883). First report: Jackson *et al.* [1922]. Probable basis of the citation of *T. cornuti* from Dufferin by Dawson [1875] and from the north end of Lake Winnipeg by Bell [1880]; of *T. dioicum* var. *purpurascens* from "First crossing Souris River" by Dawson [1875]; and of *T. purpurascens* from the province by Burman [1910].

Temperate American: Alta. to s. James Bay, s. to Ariz., Mo., and O.; replaced in eastern N. Am. by *T. polygamum* Muhl.

### 3. **T. venulosum** Trel. (*T. turneri* Boivin)

Light woods, thickets, prairie, shores, and clearings in the southern three-quarters of the province. Northernmost collection: York Factory, clearing (Scoggan, 1949). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Manitoba House, near The Narrows of Lake Manitoba [J. M. Macoun, 1894; but the specimen involved is referred by Boivin to *T. confine*]. Probable basis of most early reports of *T. dioicum* from the province. Scarcely distinguishable from the following species.

Subarctic American: nw. Mack. and Great Bear L. to n. Man., James Bay, and sw. Ungava, s. to Wyo., S.D., and n. Wisc.

### 4. **T. confine** Fern.

Light woods, thickets, prairie, shores, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857); basis of the citation of *T. occidentale* Gray from that locality by Fernald [Rhodora 2: 233. 1900] and J. M. Macoun [1901]. First report: Macgregor and Carberry, east of Brandon [Shimek, 1927].

Temperate eastern American: Man. to e. Que., s. to the Great Lakes region and Vt.

## 11. RANUNCULUS L.

## (Crowfoot. Buttercup)

[*See* Drew, 1936; Benson, 1948.]

1. Petals white (yellow only at base); achenes transversely wrinkled; leaves dissected into filiform segments; plants submersed or creeping on mud, rooting at the nodes.

2. Leaves mostly fan-shaped, weak and collapsing out of water, raised on a definite petiole well above the tapering, glabrous or sparsely pubescent stipule.

3. Stamens usually 10 or more; leaves 1·5-5 cm. long; stem 1-2·5 mm. thick........ 1. *R. aquatilis* var. *capillaceus*

3. Stamens 5-8; leaves 0·5-2·5 cm. long; stem less than 1 mm. thick........ 1a. *R. aquatilis* var. *eradicatus*

2. Leaves orbicular, tending to hold their form out of water, essentially sessile at the summit of the dilated pubescent stipule........ 2. *R. circinatus* var. *subrigidus*

1. Petals yellow; achenes not transversely wrinkled.

4. Plants submersed or creeping on mud, the stems rooting at some of the nodes; submersed leaves finely dissected into linear segments.

5. Leaves irregularly fan-shaped; petals 6-17 mm. long; fruiting heads (5-)8-13 mm. long; achenes prominently corky-thickened at base and along inner margin, 2·5-3·5 mm. long........ 3. *R. flabellaris*

5. Leaves pentagonal in outline; petals 4-7 mm. long; fruiting heads 4-6 mm. long; achenes without much corky thickening, 1·5-2 mm. long.

6. Plant glabrous or nearly so; sepals 4-6 mm. long; petals 4-7 mm. long........ 4. *R. gmelini* var. *hookeri*

6. Plant markedly pubescent; sepals about 2·5-3·5 mm. long; petals 4-5 mm. long........ 4a. *R. gmelini* var. *limosus*

4. Plants terrestrial, the leaves linear and entire to broad and deeply lobed (but not finely dissected).

7. Leaves entire; stems creeping, rooting at the nodes.

8. Sepals 3 or 4, 8-10 mm. long; petals 6-13 mm. long; fruiting heads 6-8 mm. long; achenes about 4 mm. long, constricted in the middle; leaves narrowly oblong; stem rhizomatous, 2-6 mm. thick, hollow, plant of the Hudson Bay region........ 5. *R. pallasii*

8. Sepals 5, less than 3 mm. long; petals 2·5-5 mm. long; fruiting heads 1·5-3 mm. long; achenes 1·3-2 mm. long, not constricted in the middle; stems filiform.

9. Basal leaf-blades filiform or linear, barely broader than their petioles........ 6. *R. reptans*

9. Basal leaf-blades lanceolate to oval........ 6a. *R. reptans* var. *ovalis*

7. Leaves shallowly toothed to deeply lobed.

10. Sepals 3 or 4; achenes constricted in the middle; stems creeping; plants chiefly of the Hudson Bay and northern regions.

11. Stem 2-6 mm. thick, hollow; leaves 3-lobed and cuneate, or parted into 3 oblong segments; sepals 3 or 4, 8-10 mm. long........ 5. *R. pallasii*

11. Stem filiform; leaves more or less reniform, mostly solitary, very deeply 3-parted, the lobes fan-shaped and 3-7-cleft; sepals 3, 3-7 mm. long........ 7. *R. lapponicus*

10. Sepals 5 (rarely 6); achenes not constricted in the middle; stems mostly erect.
  12. Achenes longitudinally nerved, their walls thin and fragile; leaves long-petioled, ovate or reniform, mostly crenate or some merely 3-lobed at apex.
    13. Leaves relatively thin, 5-22 mm. long; sepals and petals 3-5 mm. long........................................8. *R. cymbalaria*
    13. Leaves thickish, 12-40 mm. long; sepals and petals 4-8 mm. long..................................8a. *R. cymbalaria* var. *saximontanus*
  12. Achenes not longitudinally nerved, their walls thick and firm.
    14. Achenes beakless or only minutely beaked.
      15. Basal and mid-cauline leaves long-petioled, deeply palmately lobed or divided, essentially alike; petals equalling or shorter than the sepals; stems stout, hollow..........................9. *R. sceleratus*
      15. Basal leaves usually merely crenately toothed or shallowly lobed, distinctly differing from the sessile or short-petioled, mostly deeply divided cauline ones.
        16. Petals mostly 1·5-3 mm. long, shorter than the essentially glabrous sepals.
          17. Plant glabrous or nearly so.................10. *R. abortivus*
          17. Plant minutely pilose above.......................................10a. *R. abortivus* var. *acrolasius*
        16. Petals 5-9 mm. long, much exceeding the copiously long-villous sepals; plant pilose-hirsute..................11. *R. rhomboideus*
    14. Achenes distinctly beaked, the beak 0·4-3 mm. long.
      18. Achenes 1·8-2·2 mm. long, neither strongly flattened nor wing-margined; nectary-scale attached to the petal laterally and forming a distinct pocket; long-petioled basal leaves and sessile mid-cauline leaves deeply palmately 5-9-cleft, only the uppermost 3-cleft or simple; plant of the Hudson Bay region....12. *R. pedatifidus* var. *leiocarpus*
      18. Achenes 2-4·5 mm. long, strongly flattened and usually wing-margined; nectary-scale free laterally for at least two-thirds its length, not forming a pocket.
        19. Petals 5-15 mm. long, distinctly exceeding the sepals.
          20. Basal leaves simple but deeply palmately 5-7-parted, the sessile divisions themselves deeply cleft..........13. *R. acris*
          20. Basal leaves compound, at least the terminal leaflet distinctly petioled.
            21. Roots tuberous-thickened; ultimate segments of the relatively narrow leaflets obtuse or rounded at apex.......................................14. *R. fascicularis*
            21. Roots fibrous; ultimate segments of the ovate or rhombic leaflets acute or acutish; plants commonly developing trailing leafy branches.
              22. Stigma terminating the long style, soon deciduous; beak of achene 1·8-3 mm. long, nearly straight....................................15. *R. septentrionalis*
              22. Stigma nearly covering one side of the short, stout style; beak of achene 0·8-1·5 mm. long, usually somewhat curved......................16. *R. repens*
        19. Petals 2-5(-6) mm. long, shorter than or barely exceeding the sepals.
          23. Petals 2-4 mm. long, distinctly shorter than the sepals; achenes 1·8-2·7 mm. long, in a thick-cylindric head; plant non-stoloniferous......................17. *R. pensylvanicus*
          23. Petals 3·5-6 mm. long, equalling or somewhat exceeding the sepals; achenes 2·7-3·3 mm. long, in a globose or ovoid head; plant often developing leafy stolons.......................................................18. *R. macounii*

1. **R. aquatilis** L. var. **capillaceus** (Thuill.) DC. (*R. trichophyllus* Chaix; *Batrachium trichophyllum* Schultz) White Water-Crowfoot

Ponds and quiet streams throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936; Beckett, 1948). Earliest collection seen: Rat Creek, near Portage la Prairie (Macoun, 1872). First report: Nelson River [Bell, 1880]. Basis of early reports of var. *stagnatilis* from the province. Probable basis of the citation of *R. amphibius* James from Churchill by Radforth [1950].

Subarctic circumpolar: n. Alaska and nw. Mack. to Great Bear L., south-central Keewatin, north-central Lab., and Nfld., s. to Lower Calif., N.M., S.D., Minn., and Pa.; e. Greenland; n. Eurasia.

1a. **R. aquatilus** var. **eradicatus** Laestad.

Specimens have been seen from the following localities: Churchill (Polunin, 1936); Cochrane River, lat. 58° 58′ N. (Baldwin, 1951). First report: Churchill [Benson, 1948]. Probable basis of the report of "R. *aquatilis* L. var." from Churchill by Størmer [1933].

Arctic circumpolar: n. Alaska and n. coast of Mack. to northernmost Ellesmereland, n. Lab., and Nfld., s. to Wyo. and e. Que.; w. and e. Greenland; Iceland; Eurasia.

2. **R. circinatus** Sibth. var. **subrigidus** (Drew) Benson (*R. subrigidus* Drew)

Quiet waters in the southern three-quarters of the province. Northernmost collection seen: York Factory (Scoggan, 1949); but reported (as the main form) from Churchill River between Missi Falls and the mouth of Little Churchill River by Alcock [1916]. Earliest collection seen: Punk Island, northeast of Hecla Island, Lake Winnipeg (Macoun, 1884). First report: Sewell, now Camp Hughes, near Brandon [Drew, 1936]. Basis of early reports of the main form from the province.

Arctic American: Mack. R. Delta to Foxe Basin, Baffin I., e. Que., and Nfld., s. to Mex., Tex., S.D., Minn., and Mass.

*R. longirostris* Godr., differing from the foregoing species in its fewer achenes, these with longer beaks (0·7-1·1 mm. long), is reported by Benson [1948] from "Grand Trunk Railroad, Macoun & Herriot in 1906". There is also, in the Gray Herbarium of Harvard University, a specimen from Sewell (Macoun & Herriot, No. 69788) referred here by Benson, although he cites this number in his 1948 paper under *R. circinatus* var. *subrigidus*. The former specimen (if actually a separate collection) has not been seen, and, in view of the confusion regarding the latter, it seems best to exclude this species from our flora for the present.

3. **R. flabellaris** Raf. (*R. delphinifolius* Torr.) Yellow Water-Crowfoot

Quiet waters of southern Manitoba. Specimens have been seen from the following localities: East Selkirk, about 20 miles northeast of Winnipeg (McMillan, 1932); Teulon, about 30 miles north of Winnipeg, shallow water (Peterson, 1928); Portage la Prairie, pool (Scoggan, 1953); Boissevain, north of Turtle Mountain, shallow pond (Scoggan, 1953). Also reported from Aweme, about 20 miles southeast of Brandon, by Criddle [1927]. The Gimli citation of Lowe [1943] is referable to *R. gmelini* var. *hookeri*. First report: Jackson *et al.* [1922].

Temperate American: B.C. to Me., s. to Calif., Kans., La., and N.C.

4. **R. gmelini** DC. var. **hookeri** (Don) Benson (*R. purshii* Richards.) Yellow Water-Crowfoot

Quiet waters and muddy shores throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: Portage la Prairie (Macoun & Herriot. 1906). First report: Jackson *et al.* [1922]. Probable basis of the report of *R. multifidus* from Churchill River by Bell [1880], and of *R. multifidus* var. *repens* from the province by Burman [1910].

Subarctic American: central Alaska and Great Bear L. to n. Man., e. Que., and Nfld., s. to Oreg., N.M., N.D., Ia., and Me. A map of the greater part of the distribution is given by Raup [1947, pl. XXIV].

4a. **R. gmelini** var. **limosus** (Nutt.) Hara

Shallow water and shores. Specimens have been seen from the following localities: Winnipeg (MacDonald, 1939); Hayes River near Robinson Lake, about 65 miles northeast of Norway House (Scoggan, 1949); Hayes River near The Rock, about 100 miles southwest of York Factory (Scoggan, 1949). First report: Clear Lake, Riding Mountain [Benson, 1948].

(Subarctic-)temperate western American: B.C. to north-central Man., s. to Wash., Colo., and N.D.

5. **R. pallasii** Schlecht.

Shores and shallow water. Specimens have been seen from the following localities: Berens River (Copeland, 1941), basis of the report of *Caltha natans* from that locality by Lowe [1943]; Churchill (Furniss, 1950, swamp about 13 miles south of town). First report: the present publication.

(Arctic-)subarctic ?circumpolar: n. coast of Alaska, Yukon, and nw. Mack.; shores of Hudson Bay; s. Baffin I.; Spitsbergen; n. Eurasia.

6. **R. reptans** L. (*R. flammula* vars. *reptans* Mey. and *filiformis* Hook.) Creeping Spearwort

Sandy, gravelly, or muddy shores throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., silted pond (Baldwin, 1951). Earliest collection seen: "Lake of the Woods, Man.", wet sandy shore (Dawson, 1873). First report: Lake of the Woods [Dawson, 1875].

(Arctic-)subarctic circumpolar: n. coast of Alaska and nw. Mack to Great Bear L., central Keewatin, n. Que., north-central Lab., and Nfld., s. to Oreg., Colo., Minn., and Mass.; southern half of Greenland; Iceland; n. Eurasia.

6a. **R. reptans** var. **ovalis** (Bigel.) Benson

Specimens have been seen from the following localities: Teulon, about 30 miles north of Winnipeg (Simpson, 1934); Victoria Beach, about 55 miles north-northeast of Winnipeg (Neatby, 1929); Norway House, shallow water (Scoggan, 1948); Hill Lake, north of Lake Winnipeg, shore of island (Scoggan, 1948); Nelson River at High Rock, about 25 miles northeast of Norway House, shallow water (Scoggan, 1949); Oxford Lake, shallow water (Scoggan, 1949). First report: the present publication.

(Subarctic-)temperate American: B.C. to n. Man. and Nfld., s. to Calif., Ariz., Mich., and Pa.

7. **R. lapponicus** L.

Wet, mossy woods and shores in the northern two-thirds of the province, except the extreme north. Northernmost collection seen: Churchill (Gillett & Cody, 1948). Southernmost collection seen: Porcupine Mountain, swamps and wet mossy woods (Macoun, 1881). Earliest collection seen: the foregoing Porcupine Mountain specimen. First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack. to south-central Baffin I., n. Que., and s. Lab., s. to s. B.C. and n. Me.; southern half of w. Greenland; Spitsbergen; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXV].

8. **R. cymbalaria** Pursh (var. *americanus* DC.; incl. var. *alpinus* Hook.; *Halerpestes cymbalaria* (Pursh) Greene) Seaside Crowfoot

Salt marshes and moist or wet ground, chiefly alkaline, throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857; f. *hebecaulis* Fern.). First report: Red River [Bourgeau, in Palliser, 1863].

Arctic ?circumpolar: n. coast of Alaska and Mack., central Victoria I., n. Man., se. Lab., and Nfld., s. to Mex., Tex., Ark., Ill., and N.J.; sw. Greenland; Scandinavia (prob. introduced, acc. to Hultén); Asia.

Forma *hebecaulis* Fern., with petioles and/or peduncles pilose, is of common occurrence in the province.

The northern Manitoba material does not lend itself satisfactorily to separation as var. *alpinus* Hook, from the southern typical form, and the writer is inclined to agree with Fernald [Rhodora 16: 162. 1914] that this northern variety "seems to be merely a dwarfed extreme such as can be found in unfavourable habitats nearly throughout the range."

8a. **R. cymbalaria** var. **saximontanus** Fern.

This variety is admitted with some hesitation to our flora on the basis of a single specimen from Brandon (Macoun, No. 12355, June 11, 1896), determined by Benson. First report: Brandon [Benson, 1948].

Temperate western American: B.C. to Man., s. to Calif., Tex., Mex., and S. Am.

9. **R. sceleratus** L. (Incl. var. *multifidus* Nutt.) Cursed Crowfoot

Wet ground and shallow water, often brackish or alkaline, throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first seen being one made by Porsild in 1930). Earliest collection seen: "Lake of the Woods, Man." (Dawson, 1873); probable basis of the report of *R. affinis* from that locality by Dawson [1875]. First report: Churchill River [Bell, 1880].

Subarctic circumpolar: Seward Pen., Alaska, and Mack. R. Delta to Great Slave L., n. Man., e. Que., and Nfld., s. to Calif. and Fla.; Eurasia.

Forma *natans* Glück, the aquatic extreme with leaves all basal, their blades floating, is known from Whitewater Lake north of Turtle Mountain, and from Whiteshell Forest Reserve. It is probably of fairly common occurrence in shallow water throughout the Manitoba area.

10. **R. abortivus** L. Kidneyleaf-Buttercup

Damp woods, thickets, shores, and clearings in the southern half of the province. Northernmost collection: The Pas, woods (Krivda, 1949). Earliest collection seen: Manitoba House, near The Narrows of Lake Manitoba (Macoun, 1881). First report: Dufferin [Dawson, 1875; but the specimen involved is referable to the following variety].

Subarctic American: sw. Alaska and south-central Yukon to n. Alta., s. James Bay, and Nfld., s. to Wash., Colo., Tex., and Fla.

10a. **R. abortivus** var. **acrolasius** Fern.

Similar habitats in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, thicket (Burgess, 1873). First report: Lake Winnipeg Valley and Mile 214, Hudson Bay Railway [Fernald, Rhodora 40: 419, 1938].

Essentially the range of the species.

11. **R. rhomboideus** Goldie (*R. ovalis* of auth., not Raf.) Prairie-Buttercup

Prairie habitats, rock outcrops, and clearings in the southern two-fifths of the province. Northernmost collection: Norway House, near the north end of Lake Winnipeg, rock outcrops and clearings (Scoggan, 1948). Earliest collection seen: Long (Pembina) River, southwest of Winnipeg, open prairie (Burgess, 1874). First report: Red River and Pembina Mountain [Dawson, 1875].

Temperate American: B.C. to se. Ont., s. to Neb. and Ill.; reported from near Montreal, Que., by Macoun [1883].

12. **R. pedatifidus** Sm. var. **leiocarpus** (Trautv.) Fern. (*R. affinis* R. Br.)

Known in the province only from Churchill, where it was first collected by Macoun in 1910. It is a species of tundra habitats. First report: Churchill [Tyrrell, 1897].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to about lat. 80° N.), n. Que., n. Lab., and Nfld., s. to s. Alta., James Bay, and e. Que.; Greenland; Spitsbergen; n. Eurasia.

13. R. ACRIS L. Common Buttercup

Fields, meadows, and clearings in the southern three-quarters of the province. Northernmost collection seen: York Factory, clearing (Scoggan, 1949). Earliest collection seen: Brandon, by railway station (Macoun, 1896). First report: Churchill River [Bell, 1880; a most interesting report in need of verification].

European: widely naturalized in North America.

14. **R. fascicularis** Muhl. Early Buttercup

A specimen (in the herbarium of the Division of Botany, Dept. of Agric., Ottawa) has been seen from "Cartwright's Point", presumably near the south end of Lake Winnipeg or in the southern prairie region, where it was collected in 1892 by I. K. McMorine. First report: "Canada, to the south of Lake Winnipeg" [Hooker, 1829]. The report of the species from Churchill by McClure [1943] is probably referable to *R. pedatifidus* var. *leiocarpus*.

Temperate eastern American: s. Man. to Ont. and N.H., s. to Ia. and Ga.

15. **R. septentrionalis** Poir. Swamp-Buttercup

Specimens have been seen from the following localities: Woodridge, about 35 miles southeast of Winnipeg, marshy ground (Scoggan, 1951); Birds Hill, near Winnipeg (Simpson, 1935); Gimli, about 45 miles north of Winnipeg (Buller, 1918); Victoria Beach, about 55 miles north-northeast of Winnipeg (Neatby, 1929, wooded swamp; Dudley, 1931). First report: Jackson *et al.* [1922].

(Subarctic-)temperate eastern American: s. Man. to James Bay, e. Que., and s. Lab., s. to Tex., Ky., and Va.; in s. Alaska and n. B.C., ssp. *pacificus* Hult.

16. R. REPENS L. Creeping Buttercup

Specimens have been seen from the following localities: Sandilands Forest Reserve southeast of Winnipeg (Dudley, 1930); Vivian, about 25 miles east of Winnipeg (Quelch, 1951). First report: Red River prairie, swampy ground [Dawson, 1875].

European: widely naturalized in North America.

17. **R. pensylvanicus** L. f. Bristly Crowfoot

Marshy ground, shores, and clearings in the southern three-quarters of the province. Northernmost collection: York Factory, alluvial soil of landslide gully (Scoggan, 1949). Earliest collection seen: Killarney, near

Turtle Mountain, shore of Pembina River (Macoun, 1896). First report: Burman [1910]. The report of *R. hispidus* Michx. from Winnipeg by Lowe [1943] is referable here.

(Subarctic-)temperate American: Alaska (introd.) to s. Lab. and Nfld., s. to Oreg., Colo., Neb., and Pa.; e. Asia.

18. **R. macounii** Britt.

Wet meadows, shores, ditches, and clearings in the southern four-fifths of the province. Northernmost collection: Churchill River at Northern Indian Lake (Cairnes, 1915). Earliest collection seen: Brandon, ditches (Macoun, 1896). First report: Burman [1910]. Probable basis of the report of *R. hispidus* Michx. from Dufferin by Dawson [1875].

Subarctic American: central Alaska and nw. Mack. to n. Man., James Bay, s. Lab., and Nfld., s. to Calif., N.M., Kans., Mich., and e. Que.

*R. recurvatus* Poir. is included in the checklists of Jackson *et al.* [1922] and Lowe [1943], but without locality, and Manitoba is included in the range given by Fernald [1950]. No specimens have been seen, however, and the species should be excluded from our flora for the present.

### *Adonis* L.

*A. annua* L., Pheasant's Eye, is reported as a garden escape near the town of Shoal Lake, south of Riding Mountain, by Lowe [1943], and a specimen has been seen from Edwin, southwest of Portage la Prairie (MacMillan, 1948). The species, however, is scarcely a naturalized element of our flora.

## 46. BERBERIDACEAE

### (Barberry Family)

1. Stem bearing a single large triternate leaf above the middle, and usually a smaller one at base of panicle, the leaflets 2-5-lobed toward apex; plant herbaceous. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *Caulophyllum*

1. Stem leafy throughout, the leaves simple, bristle-toothed; spiny shrub . . . . . . . *Berberis*

### 1. Caulophyllum Michx.

1. **C. thalictroides** (L.) Michx. Blue Cohosh

Specimens have been seen from the following localities: Portage la Prairie, woods along Assiniboine River (Herriot, 1906); East Selkirk, about 20 miles northeast of Winnipeg (Armstrong, 1928; Jackson, 1932; Simpson, 1940). First report: Portage la Prairie [J. M. Macoun, 1906].

Temperate eastern American: s. Man. to N.B., s. to Mo. and S.C.; e. Asia.

### *Berberis* L.

*B. vulgaris* L., the Common Barberry of Europe, formerly planted and frequently escaped, has been the object of a campaign of extermination in Manitoba and elsewhere because of its role as alternate host of black rust of wheat. Whenever found, it is immediately eradicated, so cannot be included as a naturalized member of our flora. It was first collected in the province by H. Groh, in 1921, near Winnipeg, and individuals were found as late as 1953 by G. Stevenson in damp woodland at Brandon.

## 47. MENISPERMACEAE

(Moonseed Family)

### 1. MENISPERMUM L.

(Moonseed)

1. **M. canadense** L. Yellow Parilla

Thickets and woods of southern Manitoba. Northernmost collection: East Selkirk, about 20 miles northeast of Winnipeg, border of rich elm woods (Scoggan, 1951). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Lake Winnipeg [Bourgeau, in Palliser, 1863].

Temperate eastern American: se. Man. to w. Que. and w. N.E., s. to Okla. and Ga.

## 48. PAPAVERACEAE

(Poppy Family)

1. Flowers regular, mostly solitary on the peduncles, the 4-12 petals spurless; sepals usually two, large, soon withering and falling; stamens distinct; juice orange-red or milky.
  2. Capsule 2-valved; petals 8-12, white; leaf solitary, basal, roundish, palmately veined and lobed, it and the flowering scape from a stout rhizome with orange-red juice ........ 1. *Sanguinaria*
  2. Capsule opening by a circle of pores under the broad flat stigma; petals mostly 4, white, purple, or scarlet; stems leafy, the leaves pinnately veined and lobed....... 2. *Papaver*
1. Flowers laterally compressed, racemose, 1 or 2 of the petals more or less saccate at base; sepals small and scale-like; stamens in 2 sets of 3 each, their filaments often united; leaves compoundly dissected; juice watery.
  3. Corolla white or purplish, spongy and persistent, subcordate, the 2 outer petals somewhat saccate at base; capsule several-seeded; plant climbing by the leaf-stalks........ 3. *Adlumia*
  3. Corolla deciduous, only one of the petals saccate.
    4. Fruit a slender dehiscent capsule with few to several crested seeds.... 4. *Corydalis*
    4. Fruit globose, indehiscent, with a single non-crested seed; flowers purplish or flesh-colour, tipped with crimson........ 5. *Fumaria*

### 1. SANGUINARIA L.

(Bloodroot)

1. **S. canadensis** L. Red Puccoon

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg (Dudley, 1930); Sprague, about 90 miles southeast of Winnipeg, woods (Scoggan, 1953); Woodhaven, near Winnipeg (McMillan, 1948). Reported also from Roseisle and Notre Dame de Lourdes by Lowe [1943]. First report: "Winipeg River" [Bourgeau, in Palliser, 1863].

Temperate eastern American: se. Man. to e. Que., s. to e. Tex. and n. Fla.

## 2. PAPAVER L.

(Poppy)

1. Leaves deeply lobed, tapering to the petioled base; corolla bright scarlet; capsules somewhat top-shaped; plant green, bristly.................................1. *P. rhoeas*

1. Leaves wavy, deeply toothed, rounded at the base and prominently clasping; corolla mostly white or purple; capsules ovoid or globose; plant glaucous and glabrous.................................*P. somniferum*

1. P. RHOEAS L. Corn-Poppy

Planted and escaped from cultivation. Specimens have been seen from the following localities: near Winnipeg (Denike, 1942); Hazelridge, east of Winnipeg (Batho, 1937); Altamont, about 70 miles southwest of Winnipeg, ditch near garden (Scoggan, 1953). First report: east of Winnipeg [Groh & Frankton, 1948].

European: escaped from cultivation in North America.

*P. somniferum* L., Common Poppy, was collected by the writer in 1951 as a garden escape at Sandy Lake, about 50 miles north of Brandon. It can hardly be considered a naturalized member of our flora.

## 3. ADLUMIA Raf.

1. **A. fungosa** (Ait.) Greene Climbing Fumitory

A specimen has been seen only from West Hawk Lake, east of Winnipeg near the Ontario boundary (Lowe, 1940, moist woods). First report: West Hawk Lake and Victoria Beach [Lowe, 1943].

Temperate eastern American: se. Man. to e. Que., s. to Tenn. and N.C.

## 4. CORYDALIS Medic.

(Corydalis)

1. Flowers roseate or purplish-green, yellow-tipped, the spur very short and rounded; capsules erect or ascending, linear-cylindric, mostly 3-5 cm. long; stem erect.................................1. *C. sempervirens*

1. Flowers golden-yellow, the spur up to half as long as the body; capsules loosely spreading or pendulous, mostly shorter and thicker, necklace-like; stem lax and diffusely branched.................................2. *C. aurea*

1. **C. sempervirens** (L.) Pers. (C. *glauca* Pursh) Pale Corydalis

Rocky ground and clearings almost throughout the province. Northernmost collection: Nejanilini Lake, lat. 59° 22′ N., dry, rocky ground in isolated stand of black spruce and larch (Scoggan & Baldwin, 1950). Earliest collection seen: north end of Lake Winnipeg (Bell, 1879). First report: Winnipeg and Northwest Angle Road [Dawson, 1875].

Subarctic American: central Alaska and Great Bear L. to s. Keewatin, interior Lab., and Nfld., s. to s. B.C., Mont., Minn., and n. Ga. A map of the greater part of the distribution is given by Braun [Rhodora 39: 199 (map 25). 1937].

2. **C. aurea** Willd. Golden Corydalis

Rocky ground, sandy shores, and clearings throughout the province except the extreme north. Northernmost collection: Churchill River at Northern Indian Lake (Cairnes, 1915. Earliest collection seen: Turtle Mountain, thickets (Burgess, 1873). First report: Dufferin, Pembina Mountain, and Turtle Mountain [Dawson, 1875].

Subarctic American: central Alaska and Great Bear L. to n. Man. and e. Que., s. to Calif., Tex., Mo., W. Va., and N.Y.

### 5. FUMARIA L.

(Fumitory)

1. F. OFFICINALIS L.

Specimens have been seen from the following localities: Holmfield, northeast of Turtle Mountain (Marshall, 1945); Killarney, northeast of Turtle Mountain (1944; name of collector not given); Boissevain, north of Turtle Mountain (Stevenson, 1944); Miniota, about 50 miles west-northwest of Brandon (Wood, 1940); Decker, near Brandon (Keeling, 1945). First report: Hamiota and Miniota [Lowe, 1943].

European: widely naturalized in North America.

## 49. CAPPARIDACEAE

(Caper Family)

1. Petals entire, white or roseate; slender stalk of capsule as long as pedicel; plant glabrous.......1. *Cleome*
1. Petals notched at apex, whitish; capsule only slightly raised above the base of calyx on a short stalk; plant with glandular or clammy pubescence.......2. *Polanisia*

### 1. CLEOME L.

1. **C. serrulata** Pursh (*Peritoma serrulata* (Pursh) DC.) Stinking-clover

Prairie, sandhills, and clearings of southern Manitoba. Northernmost collection: Plumas, about 45 miles northwest of Portage la Prairie (1931; name of collector not given). Earliest collection seen: Boissevain, north of Turtle Mountain (Hordilak, 1921). First report: Burman [1910; as *C. integrifolia*].

Temperate western American: B.C. to Man., s. to Ariz., Kans., and Ill.

### 2. POLANISIA Raf.

(Clammyweed)

1. **P. graveolens** Raf.

A single specimen has been seen from Aweme, about 20 miles southeast of Brandon, where it was first collected in 1910 by N. Criddle. It is a species of sandy or gravelly habitats. First report: near Aweme [Criddle, 1927]. Probable basis of the citation of *P. trachysperma* T. & G. from near Carberry by Shimek [1927].

Temperate eastern American: Man. to w. Que., s. to Okla., Tenn., and Md.

## 50. CRUCIFERAE

### (Mustard Family)

1. Capsule transversely 2-jointed and fleshy, 1·2-2 cm. long, the joints 1-seeded or the lower one seedless; leaves fleshy, obovate or oblanceolate, sinuate-toothed; lower branches spreading or ascending; plant of the coastal sands of Hudson Bay............. *Cakile*

1. Capsule continuous, orbicular or globose to narrowly linear, not transversely 2-jointed.

2. Leaves awl-shaped and entire, about 1-3 cm. long, all basal; flowers few, racemose on slender pedicels; capsule ovoid or globular, 2-3 mm. long; dwarf aquatic, the whole plant usually immersed............................................8. *Subularia*

2. Leaves broader, often toothed or lobed; flowering-stems leafy; plants mostly terrestrial, sometimes subaquatic.

3. Capsule 1-2 (-3) times as long as broad.

4. Capsule splitting lengthwise, the falling valves exposing the seed and thin septum.

5. Capsule more or less flattened.

6. Capsule flattened parallel to the broad septum.

7. Basal rosettes of toothed leaves present; capsule lanceolate or oblong, with numerous wingless seeds................................1. *Draba*

7. Basal rosettes absent; leaves entire.

8. Capsule orbicular, the 4 seeds wingless; petals pale yellow, entire; leaves linear-spatulate, hoary with a dense stellate pubescence; stem low, usually much branched from the base, the branches arched-ascending............................................3. *Alyssum*

8. Capsule oblong or elliptic, the several seeds winged; petals white, deeply 2-cleft; leaves lanceolate, stellate-pubescent; stem up to 1 m. high, branched above...................................2. *Berteroa*

6. Capsule flattened at right-angles to the narrow septum, the 2 valves boat-shaped.

9. Capsule triangular, the broad summit notched; stem-leaves mostly sagittate-clasping; basal leaves deeply lobed................9. *Capsella*

9. Capsule orbicular or obovate.

10. Capsule 1-1·8 cm. long, broadly winged, usually about 12-seeded, the seeds 2-2·3 mm. long................................5. *Thlaspi*

10. Capsule 2-3·5 mm. long, wingless or narrowly winged at summit, 2-seeded........................................6. *Lepidium*

5. Capsule scarcely if at all flattened, globose to ovoid or pear-shaped.

11. Plant ashy with a dense scaly-stellate pubescence; flowers yellow; capsules globose or subglobose; flowering stems from a basal rosette of entire or obscurely sinuate-toothed narrow leaves..................4. *Lesquerella*

11. Plant glabrous or with some or all hairs simple.

12. Stem-leaves sagittate-clasping; flowers small, yellow.

13. Leaves subentire, little narrowed at base; capsule obovoid or pear-shaped, 5-9 mm. long............................11. *Camelina*

13. Leaves toothed, narrowed at base; capsule globose, 1-3 mm. long; (*R. austriaca*)....................................24. *Rorippa*

12. Stem-leaves not sagittate-clasping.

14. Rosette-leaves long-petioled, oblong to reniform, entire or remotely dentate; flowers yellow; capsule globose or ovoid; low glabrous succulent plant of the Hudson Bay coast............10. *Cochlearia*

14. Rosette-leaves (if present) short-petioled and relatively narrow, toothed or deeply lobed; plants tall, glabrous or hispid, neither succulent nor maritime.

15. Flowers white; basal and upper leaves crenately toothed, the lower stem-leaves often pinnatifid; capsule (when well developed) globose to ovoid; coarse plant up to 1·3 m. high...25. *Armoracia*

15. Flowers yellow; basal leaves mostly deeply lobed to pinnatifid; capsule globose to short-ellipsoid; plants usually smaller; (*R. islandica*)....................................24. *Rorippa*

4. Capsule indehiscent, subglobose to reniform; stem-leaves sagittate-clasping.

16. Capsule reniform or depressed-cordate, thin-walled and inflated, smooth, 2-4-seeded; racemes in corymbs; petals white......................7. *Cardaria*

16. Capsule subglobose, firm, reticulated, 1-seeded; racemes elongated and loosely disposed; petals yellow....................................12. *Neslia*

3. Capsules (3-)4-many times as long as broad.

17. Capsule indehiscent; leaves pinnatifid, with a large terminal lobe and 1 or more pairs of smaller lateral ones..................................13. *Raphanus*

17. Capsule splitting lengthwise, the falling valves exposing the seeds and the thin septum.

18. Flowering stems leafless or leafy only near the base; seeds in 2 rows in each cell.

19. Leaves entire or obscurely and remotely toothed, all basal, more or less pubescent (rarely glabrous) with simple, forking, or stellate hairs; capsules flattened, often twisted, less than 1·5 cm. long; low plants of the Hudson Bay region................................1. *Draba*

19. Leaves coarsely toothed to deeply incised or pinnatifid, glabrous, often extending up the lower part of the stem; capsules roundish in cross-section, 2-5 cm. long................................16. *Diplotaxis*

18. Flowering stems leafy.

20. Stem-leaves sessile and with auriculate or sagittate-clasping base.

21. Flowering stems arising from a definite rosette of basal leaves.

22. Capsule round or quadrate in cross-section.

23. Capsules about 1·5 cm. long, on divergent pedicels; seeds in 1 row in each cell; basal leaves entire; plant glabrous, often much branched from near base............19. *Thellungiella*

23. Capsules 4-9·5 cm. long, on erect appressed pedicels, the raceme wand-like; seeds in 1 or 2 rows; basal leaves entire or irregularly dentate, finely stellate-pubescent; stem usually simple below, hirsute at base; (*A. glabra*)..........28. *Arabis*

22. Capsule flattened, 1·5-10 cm. long, the seeds in either 1 or 2 rows; plants glabrous to copiously hirsute.................28. *Arabis*

21. Flowering stems without definite basal rosettes; capsules round or 4-angled in cross-section.

24. Leaves deeply lobed, most of them, or at least the median and lower ones, lyrate-pinnatifid (with large terminal lobe and smaller lateral ones); mature racemes often wand-like, the capsules on erect or ascending pedicels.......................26. *Barbarea*

24. Leaves, at least the median and upper ones, entire or subentire; racemes loose, the pedicels spreading-ascending.

25. Leaves all entire; capsules 4-15 cm. long........17. *Conringia*

25. Lower leaves toothed or pinnatifid; capsules 3-7 cm. long.........................................................14. *Brassica*

20. Stem-leaves sessile or petioled, not clasping.

26. Stem-leaves entire or toothed, only the basal ones sometimes lobed.........................................................GROUP A

26. Stem-leaves, or most of them, deeply cleft, pinnatifid to tripinnatifid or pinnate..........................................GROUP B

## GROUP A

27. Stems bearing closely appressed, straight, 2-pronged (malpighian) hairs attached near their middle; flowers yellow....................................23. *Erysimum*

27. Stems glabrous or pubescent (if the latter, the hairs not malpighian).

28. Flowering-stems without definite basal rosettes; flowers purple, sometimes white, usually 2-2·5 cm. long; capsules very slender, cylindrical, 5-14 cm. long..22. *Hesperis*

28. Flowering-stems arising from a definite rosette of basal leaves.

29. Capsules round in cross-section, 1·2-3 cm. long, their seeds in a single row; stem-leaves entire or toothed; rosette-leaves often toothed or sinuate; plant of the Hudson Bay and low-northern regions..........................21. *Braya*

29. Capsules flattened parallel to the septum.

30. Basal leaves usually lyrate-pinnatifid (with a large terminal lobe) or strongly toothed; seeds in 1 row in each cell; (*A. lyrata*).................28. *Arabis*

30. Basal leaves entire or merely toothed, not lyrate-pinnatifid; seeds in 2 rows in each cell.

31. Capsules 1-3 cm. long, not twisted; stem pubescent only at base, the hairs simple or forking; (*A. arenicola* var. *pubescens*).........28. *Arabis*

31. Capsules mostly less than 1·5 mm. long, often twisted; stems mostly stellate-pubescent at and above base........................1. *Draba*

## GROUP B

32. Racemes with lower pedicels subtended by leafy bracts; petals pale yellow, about 5 mm. long; capsules 4-angled, slender, 2·5-3·5 cm. long, their valves keeled..15. *Erucastrum*

32. Racemes bractless.

33. Capsules flattened, linear, opening elastically from the base, their seeds in 1 row; petals white or roseate; leaves pinnate............................27. *Cardamine*

33. Capsules round or 4-angled in cross-section; flowers yellow.

34. Capsule terminated by a long, conical or flat, indehiscent beak.

35. Capsules 4-angled, spindle-shaped, tipped by a flat triangular-lanceolate beak, erect on short, stout pedicels; seeds ellipsoid, in 2 rows in each cell; petals 1·5-2 cm. long.............................................*Eruca*

35. Capsules round or somewhat 4-angled in cross-section, their globose seeds in 1 row in each cell; petals about 1 cm. long...................14. *Brassica*

34. Capsule splitting to tip, without long indehiscent beak.

36. Pubescence of leaves and stem stellate or forked; leaves finely divided, bipinnate to tripinnatifid or tripinnate; capsules slenderly cylindric to somewhat club-shaped....................................20. *Descurainia*

36. Pubescence of leaves and stem simple or wanting; capsules linear to slenderly ellipsoid.

37. Plants perennial, with creeping bases; leaves pinnately parted, the divisions linear or lanceolate; petals much longer than the sepals; capsules linear-cylindric, 1-2·5 cm. long, their seeds 1-ranked; (*R. sylvestris*)..........................................................24. *Rorippa*

37. Plants annual or biennial, without creeping bases.

38. Petals shorter than the sepals; capsules slenderly ellipsoid, 3-9 mm. long, their seeds irregularly 2-ranked; (*R. islandica*).....24. *Rorippa*

38. Petals longer than the sepals; capsules linear or slenderly cylindric, 2-10 cm. long, their seeds 1-ranked.................18. *Sisymbrium*

## 1. DRABA L.

[*See* Fernald, 1934.]

1. Flowering-stems naked or rarely with a single small leaf; rosette-leaves entire or nearly so; loosely to densely cespitose dwarf plants of the Hudson Bay region.

2. Petals yellow; rachis and pedicels copiously villous-hirsute; leaves with copiously long-ciliate margins, otherwise glabrous or more or less pubescent with simple or forking hairs.................................................1. *D. alpina*

2. Petals white.

3. Scape and pedicels glabrous or nearly so; leaves ciliate with minute simple or 2-forked hairs, otherwise usually glabrous except toward the tips of the young leaves........................................2. *D. fladnizensis* var. *heterotricha* ✓
3. Scape and pedicels minutely stellate-tomentose; leaves hoary with a felt-like covering of stellate hairs..................................................3. *D. nivalis* ✓
1. Flowering-stems leafy (at least below), their leaves and those of the rosettes often toothed.
4. Petals yellow.
5. Fruiting pedicels filiform, usually much longer than the capsules; petals about 2 mm. long; capsules glabrous, flat; annual................10. *D. nemorosa* var. *lejocarpa* ✓
5. Fruiting pedicels rather stout, shorter than the capsules, rarely more than 4 mm. long; petals 3·5-5·5 mm. long; capsules densely pubescent, usually twisted; biennial or perennial plant of the Hudson Bay region....................4. *D. minganensis* ✓
4. Petals white; fruiting pedicels shorter than the capsules.
6. Plant annual, with only 1 or 2 pairs or groups of 3 leaves above the basal rosette; fruiting racemes rarely more than 2 cm. long..........9. *D. reptans* var. *micrantha*
6. Plants biennial or perennial, with abundantly leafy stems and basal rosettes; fruiting racemes elongate; plants of the Hudson Bay region.
7. Plant biennial, the many stem-leaves merging gradually with those of the first year's rosette; rachis and pedicels densely pilose or villous; styles very short or obsolete..........................................5. *D. incana* var. *confusa* ✓
7. Plants perennial, with relatively few and scattered stem-leaves; rachis and pedicels glabrous or minutely stellate-pubescent.
8. Capsules glabrous or nearly so, definitely veiny, little if at all twisted; pedicels spreading to ascending........................................6. *D. glabella* ✓
8. Capsules minutely stellate-pubescent, often strongly twisted.
9. Pedicels short, strongly ascending in fruit; seeds 20-48; stem-leaves 2-10.... ....................................................7. *D. lanceolata*
9. Pedicels longer, spreading-ascending; seeds at most 36; stem-leaves 1-4....... ....................................................8. *D. cinerea* ✓

1. **D. alpina** L.

Known in the province only from Churchill: (Rogers, 1936; Beckett, 1946, higher ground and moist crevices; Hyde, 1949, sand and gravel flats; Brown, 1950, rock crevices). A robust specimen collected by Porsild in 1930 is referred by him to a hybrid of this species and *D.* (*daurica*) *glabella*. The same hybrid is reported by Ekman [in Gröntved, 1936, p. 89] as having been collected at Churchill in 1923 by Birket-Smith. First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska and Mack., Can. Arct. Arch. (to s. Ellesmereland), n. Que., and n. Lab., s. to s. Alaska and n. Man.; Greenland; Iceland; Spitsbergen; n. Eurasia.

2. **D. fladnizensis** Wulf. var. **heterotricha** (Lindbl.) Ball (*D. lactea* Adams)

Known in the province only from Churchill, where it was first collected by Mrs. A. Simpson in 1943 (specimens in the herbaria of the University of Manitoba and the Manitoba Provincial Museum). It is a species of rocky, exposed, northern habitats. First report: Churchill [Ritchie, 1956]. Probable basis of reports of the main form from Churchill.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to s. Ellesmereland), n. Que., and n. Lab., s. to south-central Alta., n. Man., and the se. coast of Hudson Bay; Greenland; n. Eurasia.

3. **D. nivalis** Liljebl.

Known in the province only from Churchill, where it was first collected by Macoun in 1910. It is a species of rocky, exposed, northern habitats. First report: Churchill [Fernald, 1925, map 68, p. 339].

Arctic circumpolar (the inclusive species): n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., and n. Lab., s. to Oreg., Nev., Colo., n. Man., e. Que., and Nfld.; Greenland; Iceland; Spitsbergen; n. Eurasia.

4. **D. minganensis** (Vict.) Fern. (*D. luteola* Greene var. *minganensis* Vict.)

Known in the province only from Churchill, where it was first collected by McTavish in 1853. It is a species of rocky, exposed habitats. First report: Churchill [Ritchie, 1956].

(Subarctic-)temperate eastern American: n. Man.; James Bay; e. Que.

5. **D. incana** L. var. **confusa** (Ehrh.) Liljebl.

Specimens have been seen only from Churchill, the earliest collection seen from there having been made by P. Q. MacKinnon in 1947. The main form is also reported from York Factory by Bell [1881], and from Wilkins Point, Lake Winnipegosis, by Macoun [1883], but supporting specimens have not been seen. First report: Churchill and Nelson rivers [Bell, 1880]. Probable basis of reports of the main form from the province.

(Arctic)-subarctic eastern American: n. Man.; James Bay; n. Lab. and Nfld., s. to e. Que. and ne. N.B.; the main form also in Eurasia.

6. **D. glabella** Pursh (*D. daurica* DC.; *D. hirta* of auth., not L.)

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, sandy railroad clearing (Schofield, 1950); Churchill (many collections, the first seen being two made by Macoun in 1910, Nos. 79065 and 79068; these are cited by Fernald [1934] as the barely distinct var. *orthocarpa* (Fern. & Knowlt.) Fern., but the two sheets in the National Herbarium of Canada were annotated by Fernald in 1934 as referable to the main form); Churchill River, "clifts and crevices of rocks" (Bell, 1879). First report: Churchill [Størmer, 1933]. Probable basis of reports of *D. arabisans* Michx. from Churchill by Lowe [1943] and McClure [1943], and of *D. hirta* L. from between York Factory and Churchill by Rae [1850]. Lowe's citation of *D. arabisans* from Lake Winnipegosis is evidently based upon the report there of *D. incana* by Macoun [1883].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to Banks I. and perhaps farther north), n. Que., n. Lab., and Nfld., s. to n. B.C., n. Man., and N.Y.; Greenland; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXV].

7. **D. lanceolata** Royle (*D. stylaris* of auth., not J. Gay)

This species is admitted to our flora chiefly on the basis of the following collection: Churchill (Gillett, No. 2502, dry gravel, Aug. 12, 1948; specimen, determined by B. Boivin, in the herbarium of the Division of Botany, Dept. of Agric., Ottawa). First report: Churchill [Radforth, 1950].

Subarctic ?circumpolar: Seward Pen., Alaska, Mack. R. Delta, and Great Bear L. to n. Man. and central Lab., s. to Utah, Colo., the Great Lakes region, and n. N.E.; southern half of w. Greenland; Asia. A map of the greater part of the American distribution, on which the Churchill station should be indicated, is given by Raup [1947, pl. XXV].

8. **D. cinerea** Adams

This species is admitted to our flora on the basis of the following collection: Churchill (Eva Beckett, No. 184a, Aug. 1, 1953; specimens, determined by Porsild, in the herbaria of the University of Manitoba and the National Herbarium of Canada). First report: Churchill [Ritchie, 1956].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), s. to n. B.C., n. Man., n. James Bay, and Akpatok I., Ungava Bay; w. and e. Greenland; Spitsbergen; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXV].

9. **D. reptans** (Lam.) Fern. var. **micrantha** (Nutt.) Fern.

Specimens have been seen from the following localities: Gimli, about 45 miles north of Winnipeg, railroad ballast (Scoggan, 1953); Birds Hill, near Winnipeg (Denike, 1941); Aweme, about 20 miles southeast of Brandon (Fletcher, 1904; Criddle, 1905, sandy field; Groh, 1932); Melita, about 60 miles southwest of Brandon, sandy soil (Lowe, 1935). First report: the present publication. Basis of reports of the main form (as *D. caroliniana* Walt.) from Aweme, Elva, Melita, and Tilston by Lowe [1943].

Temperate western American: Wash. to s. Man., s. to Calif. and N.M.

10. **D. nemorosa** L. var. **lejocarpa** Lindbl. (*D. lutèa* Gilib.)

Dry, open soil almost throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: York Factory (McTavish, 1854). First report: "Red River to Saskatchewan" [Bourgeau, in Palliser, 1863; as *D. lutea*].

Subarctic circumpolar: central Alaska and north-central Mack. to n. Man., s. to n. Calif., Colo., S.D., and n. Minn.; reported from Repulse Bay, Melville Pen., where doubtless introd.; introd. eastward; Eurasia.

### 2. BERTEROA DC.

1. B. INCANA (L.) DC. Hoary Alyssum

Sandy roadsides and waste ground. Specimens have been seen from the following localities: Tolstoi, about 50 miles south of Winnipeg, dry places around farmyard (Howe, 1936); Stuartburn, near Tolstoi (Prodan, 1937); South Junction, about 80 miles southeast of Winnipeg, dry, sandy roadside (Scoggan, 1951); Ethelbert, east of Duck Mountain, sandy roadside (Scoggan, 1953). First report: Stuartburn and Tolstoi [Lowe, 1943].

European: widely naturalized in North America.

### 3. Alyssum L.

1. A. alyssoides L. (*A. calycinum* L.)

Cultivated and escaped from gardens. A specimen has been seen only from Edwin, about 10 miles southwest of Portage la Prairie, where it was collected by Mrs. E. J. McMillan in 1948. First report: Burman [1910].

European: widely naturalized in North America.

### 4. Lesquerella Wats.

[*See* Payson, 1921.]

1. Capsules glabrous, on ascending pedicels; plant of the Hudson Bay region. . 1. *L. arctica*
1. Capsules densely stellate-pilose, on recurving pedicels; plant of the southern region. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *L. ludoviciana*

1. **L. arctica** (Wormskj.) Wats.

Known in Manitoba only from Churchill, the first collection seen from there being one made in 1930 by an unknown collector. It is a species of barren, exposed habitats. First report: Churchill [Lowe, 1943].

Arctic American (incl. ssp. *purshii* (Wats.) Porsild): n. coast of Alaska and Mack., Can. Arct. Arch. (to central Ellesmereland), n. Lab., and Nfld., s. to central Alta., n. Man., and Anticosti I., Que.; Greenland; e. Asia. Maps of the distribution (incomplete), on which the occurrence of the species at Churchill should be indicated, are given by Fernald [1925, map 55, p. 323; 1929, map 12, p. 1492].

2. **L. ludoviciana** (Nutt.) Wats. (*L. argentea* (Pursh) MacM.)

Dry, sandy or rocky prairie habitats and clearings of southern Manitoba. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, dry limestone substratum (Scoggan, 1951). Earliest collection seen: "East Crossing Souris River" (Burgess, 1874). First report: about a mile west of the junction of the Qu'Appelle and Assiniboine rivers [Macoun, 1883].

Temperate western American: Mont. and Alta. to s. Man., s. to Ariz., Colo., and Kans.; isolated in Ill.

*L. arenosa* (Richards.) Rydb. (*L. versicolor* Greene; *L. macounii* Greene), separated from the foregoing species chiefly on the basis of its secund (one-sided) racemes, is cited from Stony Mountain, near Winnipeg, by Payson [1921], and from Lauder, about 45 miles southwest of Brandon, by Lowe [1943]. The writer, however, has been unable to see more than one species in the southern Manitoba material.

*L. spathulata* Rydb. (*L. alpina* (Nutt.) Wats. var. *spathulata* (Rydb.) Payson), attaining its eastern limit in Saskatchewan according to Payson [1921], is reported from Aweme, about 20 miles southeast of Brandon, by Lowe [1943]. The specimen involved, however (R. W. White, 1922), is referable to *L. ludoviciana.*

### 5. THLASPI L.

(Penny-Cress)

1. T. ARVENSE L. Frenchweed. Stinkweed

Gardens, fields, and waste places throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1934). Earliest collection seen: Fort Garry (Schultz, 1860). According to Macoun [1883], the species was already a real pest in Manitoba at that early date. First report: Fort Garry [Schultz, 1861].

European: widely naturalized and a troublesome weed in North America.

### 6. LEPIDIUM L.

(Peppergrass)

[*See* Hitchcock, 1936.]

1. Plant with short axillary racemes in the axils of the upper leaves, as well as longer terminal ones; petals linear, shorter than the sepals; capsules 2·5-3·5 mm. long, tapering somewhat to summit; upper leaves linear and entire, the lower ones few-toothed........................................................1. *L. ramosissimum*

1. Plants with only elongated terminal racemes; petals wanting or rudimentary; capsules 2-3 mm. long.
    2. Capsules oval or elliptic-ovate, gradually narrowed to the apical teeth; basal leaves bipinnatifid....................................................2. *L. ruderale*
    2. Capsules round-cordate or round-obovate, strongly rounded at summit; basal leaves coarsely toothed to pinnatifid....................................3. *L. densiflorum*

1. **L. ramosissimum** Nels. (*L. fletcheri* Rydb.)

Dry, open soil throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936; Beckett, 1946, 1948). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Winnipeg [Hitchcock, 1936].

Temperate western American: Mont. to Sask. and Man., s. to Calif. and N.M.; spreading eastward to e. Que.

2. L. RUDERALE L.

Specimens have been seen from the following localities: "Manitoba", plains (Macoun, 1872); "Plains of Manitoba" (Canby, 1897); Winnipeg (Frankton & Bibbey, 1947); Brandon, waste places (Macoun, 1896). First report: near York Factory ["H", Richardson, in Franklin, 1823]. This northern citation remains to be verified.

European: naturalized in North America.

3. **L. densiflorum** Schrad. (*L. apetalum* of auth., not Willd.)

Waste ground and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Gillett & Core, 1948). Earliest collection seen: Fort Garry and Assiniboine River (Schultz, 1861). First report: Jackson *et al.* [1922]. Probable basis of the listing of the Cordilleran *L. intermedium* Gray by Burman [1910], and its reports from Manitoba by Macoun [1883] and from Oxford House to Knee Lake by Bell [1881], and of the citation of *L. virginicum* L. from near Carberry by Shimek [1927].

(Subarctic-)temperate American: B.C. and n. Man. to e. Que., s. throughout much of the U.S.; introd. northward and into Europe.

*L. sativum* L., Garden-Cress, is reported by Bourgeau [in Palliser, 1863] as "Introduced at Red River", and by Macoun [1883] as "Frequent close to Old Fort Garry, Winnipeg, Man." No specimens have been seen, however, and, according to Hitchcock [1936], the species apparently does not become established in North America.

## 7. CARDARIA Desv.

[*See* Groh, Sci. Agr. 20: 750-756. 1940; Rollins, Rhodora 42: 302-306. 1940; Corns & Frankton, Sci. Agr. 32: 484-495. 1952.]

1. Fruits subglobose, pubescent........................... 1. *C. pubescens* var. *elongata*
1. Fruits essentially glabrous.
    2. Fruits reniform or depressed-cordate, only slightly flattened............. 2. *C. draba*
    2. Fruits orbicular, strongly flattened........................ 2a. *C. draba* var. *repens*

1. C. PUBESCENS (Mey.) Rollins var. ELONGATA Rollins Whitetop

The following specimen, in the herbarium of the Division of Botany, Dept. of Agric., Ottawa, is the only one seen: Oak Bluff, near Winnipeg (Wood, 1951; determined by Groh). First report: Oak Bluff [Groh & Frankton, 1949].

Asiatic: naturalized in temperate North America.

2. C. DRABA (L.) Desv. (*Lepidium draba* L.) Hoary Cress

Specimens have been seen from the following localities: Brandon (Fletcher, 1897, 1904; unknown collector, 1931; Burman, undated); Sinclair, about 60 miles west-southwest of Brandon (Langstaff, 1941). First report: Brandon [Jackson *et al.*, 1922].

European: naturalized in temperate North America.

2a. C. DRABA var. REPENS (Schrenk) Schulz

The following specimens, all in the herbarium of the Division of Botany, Dept. of Agric., Ottawa, have been seen: Oak Bluff, near Winnipeg (Wood, 1941); Brandon (Dudley, 1941); Deloraine, northwest of Turtle Mountain (Batho, date uncertain). First report: Deloraine [Groh, Can. Field-Nat. 55: 55. 1941].

European: naturalized in temperate North America.

### 8. SUBULARIA L.

(Awlwort)

1. **S. aquatica** L.

Specimens have been seen from the following localities: lakes near Ontario-Manitoba boundary (Simpson, 1941); Reindeer Lake, lat. 57° 54′ N., silted sandy bottom 3 feet deep (Baldwin, 1951). First report: Lowe [1943].

Subarctic circumpolar: north-central Alaska and Great Bear L. to s. Keewatin, s. Lab., and Nfld., s. to Calif., Wyo., Ont., and n. N.E.; s. Greenland; Iceland; Eurasia.

### 9. CAPSELLA Medic.

1. C. BURSA-PASTORIS (L.) Medic. Shepherd's-purse

Gardens, clearings, and waste land throughout the province except the extreme north. Northernmost collection: Churchill (Beckett, 1946). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Fort Garry [Schultz, 1861].

European: widely naturalized in North America.

### 10. COCHLEARIA L.

(Scurvygrass)

1. **C. officinalis** L. (Incl. var. *groenlandica* (L.) Gelert)

Known in the province only from Churchill, where it was first collected by Porsild in 1930. It is a species of saline coastal habitats. First report Churchill [Polunin, 1940].

Arctic circumpolar (the inclusive species): n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., and n. Lab., s. to n. Man. and Nfld.; Greenland; Iceland; Spitsbergen; n. Eurasia.

### 11. CAMELINA Crantz

(False Fax)

1. Capsules mostly 7-9 mm. long, the walls soon hardening, the slender beak up to one-third the length of the body; seeds mostly 1-1·5 mm. long; stem glabrous or with minute stellate hairs.......1. *C. sativa*

1. Capsules about 5 mm. long, the walls remaining thin, the slender beak up to half as long as the body; seeds mostly less than 1 mm. long; stem and leaves harsh with long simple and branching hairs.......2. *C. microcarpa*

1. C. SATIVA (L.) Crantz

Roadsides and clearings of southern Manitoba. Specimens have been seen from the following localities: "Dawson Road, Man.", sandy soil, (Dawson, 1873); Deloraine, near Turtle Mountain (Fletcher, 1896); Virden, about 45 miles west of Brandon (no data); Birtle, about 60 miles northwest of Brandon, railroad yard (Scoggan, 1953); Fairford, about 110 miles north of Portage la Prairie (Burman; undated). First report: "Introduced at Red River" [Bourgeau, in Palliser, 1863].

European: widely naturalized in North America.

2. C. MICROCARPA Andrz.

Clearings, fields, and waste places of southern Manitoba. Northernmost collection: Swan River, north of Duck Mountain (Groh, 1922). Earliest collection seen: Brandon, waste places and fields (Macoun, 1896). First report: Jackson *et al.* [1922].

European: widely naturalized in North America.

### 12. NESLIA Desv.

(Ball-Mustard)

1. N. PANICULATA (L.) Desv.

Fields, roadsides, and clearings in the southern third of the province, and reported by Gardner [1937] from Churchill. Northernmost collection seen: Porcupine Mountain, dry roadside (Scoggan & Baldwin, 1950). Earliest collection seen: Portage la Prairie (McMorine, 1891). First report: "Introduced at Red River" [Bourgeau, in Palliser, 1863].

European: widely naturalized in North America.

### 13. RAPHANUS L.

(Radish)

1. Petals pale purple; capsules 6-10 mm. thick, continuous, 2-3-seeded, with conical beak ........ 1. *R. sativus*

1. Petals pale yellow (turning whitish), with violet veins; capsules 4-6 mm. thick, strongly constricted between the 2-8 seeds, the beak slender ........ 2. *R. raphanistrum*

1. R. SATIVUS L. Radish

The following specimens have been seen: Brandon, streets and vacant lots (Macoun, 1892); Pipestone, about 50 miles west-southwest of Brandon (Horner, 1924). The latter specimen is the basis of the report of *Iodanthus pinnatifidus* from Pipestone by Lowe [1943]. First report: the present publication.

European: widely cultivated and sometimes escaped in North America.

2. R. RAPHANISTRUM L. (*Raphanistrum innocuum* Moench) Wild Radish. Jointed Charlock

A single specimen has been seen from Old Kildonan, Winnipeg, where it was collected in 1944 by G. E. Swailes. First report: Jackson *et al.* [1922].

European: naturalized in North America.

## 14. Brassica L.

## (Mustard)

1. Upper leaves sessile and clasping by the auriculate base; lower leaves sparingly toothed or pinnatifid........................................................ 1. *B. campestris*
1. Upper leaves tapering at base, not clasping, entire or toothed; at least the lower leaves lyrate-pinnatifid.
    2. Beak round in cross-section, empty; valves of capsule with only the midnerve prominent; plant often somewhat glaucous.................................... 2. *B. juncea*
    2. Beak 4-angled and flat, often with a seed in its base; valves of capsule with two lateral nerves about as prominent as the midnerve; plant green................. 3. *B. kaber*

1. B. campestris L. (Incl. *B. rapa* L.) Field Mustard. Bird's Rape

Specimens have been seen from the following localities: "White Horse Plains, Man." (Macoun, 1879); Winnipeg (Fletcher, 1896); St. Boniface, near Winnipeg (Denike, 1943); Brandon, weed in streets (Macoun, 1896); Ste. Rose, northeast of Riding Mountain (Groh, 1932); Dauphin, north of Riding Mountain (Groh, 1932). First report: "Common in fields in Manitoba and around Winnipeg" [Macoun, 1883].

Eurasian: naturalized in North America and often a troublesome weed.

2. B. juncea (L.) Coss. Chinese or Leaf-Mustard

Specimens have been seen from the following localities: Winnipeg (several collections, the first by Fletcher in 1896); Sturgeon Creek, near Winnipeg (Marquardt, 1930); Teulon, about 30 miles north of Winnipeg (Simpson, 1934); St. Norbert, south of Winnipeg (Groh, 1922); Churchill (Beckett, 1946; specimen determined by C. Frankton). First report: Jackson *et al.* [1922].

Eurasian: widely naturalized in North America.

3. B. kaber (DC.) L.C. Wheeler (Incl. vars. *pinnatifida* (Stokes) Wheeler and *schkuhriana* (Reichenb.) Wheeler; *B. arvensis* of auth., not L.; *B. sinapistrum* Boiss.; *Sinapis arvensis* L.) Charlock

Fields and waste places throughout the province except the extreme north. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg [Dawson, 1875].

Eurasian: widely naturalized and a very troublesome weed in North America.

*B. nigra* (L.) Koch: reports of this species from the province appear to be referable to the foregoing species.

*B. hirta* Moench (*Sinapis alba* L.) is reported from the province by Lowe [1943], but no specimens have been seen, and it should be excluded from our flora for the present. Its citation from Fort Garry by Schultz [1861] is referable to *B. Kaber*.

## 15. Erucastrum Presl

1. E. gallicum (Willd.) O.E. Schulz (*E. pollichii* Schimper & Spenner)

Fields, roadsides, and clearings in the southern half of the province. Northernmost collection: Wekusko Lake, near mouth of Grassy River, about

85 miles northeast of The Pas, clearings and trails (Scoggan, 1949). Earliest collection seen: Emerson, near the International Boundary south of Winnipeg (Groh, 1922). First report: Emerson [Groh, Canadian Field-Naturalist 55: 55. 1941].

European: widely naturalized in North America.

### 16. DIPLOTAXIS DC.

1. D. MURALIS (L.) DC. Sand Rocket

A single specimen has been seen from Winnipegosis, east of Duck Mountain, where it was collected by A. E. Mudery in 1952 (specimen determined by C. Frankton). First report: Lowe [1943]. The citation from Wekusko Lake by Scoggan [1951] is referable to *Erucastrum gallicum.*

European: naturalized in North America.

*D. tenuifolia* (L.) DC. is reported from "Big Grass Marsh", probably the marshy area south of Glenboro, in the undated supplement to Lowe's 1943 checklist. No specimen has been seen, however, and it must be excluded from our flora.

### 17. CONRINGIA Link

(Hare's-ear-Mustard)

1. C. ORIENTALIS (L.) Dumort.

Locally in fields and waste places throughout the province except the extreme north. Northernmost collection: Churchill (Beckett, 1946, railroad tracks; Core, 1948, roadside). Earliest collection seen: Carberry, east of Brandon (Fletcher, 1896). First report: Jackson *et al.* [1922].

European: widely naturalized in North America.

### 18. SISYMBRIUM L.

1. Petals pale yellow, 6-8 mm. long; capsules 5-10 cm. long, scarcely thicker than the short stout pedicels; segments of leaves elongate-linear; stem sparsely spreading-hirsute at base........1. *S. altissimum*
1. Petals bright yellow, 5-6 mm. long; capsules 2-3·5 cm. long, on capillary pedicels 0·7-1·5 cm. long; segments of leaves triangular; lower part of stem hirsute with downwardly directed hairs........2. *S. loeselii*

1. S. ALTISSIMUM L. Tumble-Mustard

Fields, roadsides, and waste places throughout the province except the extreme north. Northernmost collection: Churchill (Gardner, 1933; Beckett, 1950). Earliest collection seen: Plum Coulee, about 50 miles southwest of Winnipeg (Burman, 1895). First report: Jackson *et al.* [1922; as *Norta altissima*].

European: widely naturalized in North America.

2. S. LOESELII L.*

Similar habitats and distribution in the province, but much less abundant. Northernmost collection: Churchill (Beckett, 1950). Earliest collection seen: Brandon (Groh, 1932). First report: south of Brandon [Groh, Canadian Field-Naturalist 55: 55. 1941].

European: naturalized in North America.

### 19. THELLUNGIELLA O.E. Schulz

1. **T. salsuginea** (Pall.) O. E. Schulz (*Sisymbrium salsugineum* Pall.; *Arabidopsis glauca* (Nutt.) Rydb.)

Specimens have been seen from the following localities: Winnipeg, brookside (Burman, 1900); Cartwright, east of Turtle Mountain (Burman; undated). It is a plant of saline or alkaline soils. First report: Winnipeg West and Cartwright [Groh, Canadian Field-Naturalist 55: 55. 1941].

Subarctic western American: sw. Yukon, coast of nw. Mack., and ne. Alta., s. to Mont., Colo., and w. Ont.; e. Asia.

### 20. DESCURAINIA Webb & Berthelot

### (Tansy-Mustard)

[*See* Detling, 1939.]

1. Capsules club-shaped, up to 12 mm. long, on spreading-ascending pedicels 8-16 mm. long, their seeds 2-ranked; plant green, more or less pubescent and glandular.................................................... 1. *D. pinnata* var. *brachycarpa*
1. Capsules linear-cylindric, their seeds 1-ranked.
    2. Racemes condensed near top, the flowers surpassed by a dense subumbellate cluster of young capsules crowning an elongated raceme of older capsules; plant glabrous to moderately pubescent, the racemes and top of stem sometimes glandular; plant of the Hudson Bay and low-northern regions......................2. *D. sophioides*
    2. Racemes uniformly elongated; plants non-glandular.
        3. Capsules 1-3 cm. long, usually arching, on spreading-ascending pedicels up to 1·5 cm. long; calyx 2-2·5 mm. long; plant stellate-pubescent.........3. *D. sophia*
        3. Capsules 5-10 mm. long, straight, on strongly ascending pedicels 3-6 mm. long; calyx 1-1·5 mm. long; plant hoary with grey pubescence........4. *D. richardsonii*

1. **D. pinnata** (Walt.) Britt. var. **brachycarpa** (Richards.) Fern. (*Sisymbrium brachycarpum* Richards.; *Sisymbrium canescens* var. *brachycarpum* Wats.)

Prairie and clearings of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, gravel pit and sandy prairie (Scoggan, 1951). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Red River [Dawson, 1875]. Probable basis of the citations of *Sisymbrium canescens* from Fort Garry by Schultz [1861], from Pembina Mountain by Dawson [1875], and from Carberry by Shimek [1927], and of *Sophia intermedia* Rydb. from the province by Lowe [1943].

(Subarctic-)temperate American: Great Slave Lake; B.C. to e. Que., s. to Mont., Colo., Tex., and N.Y. A map of the northern part of the distribution is given by Detling [1939, map 1].

2. **D. sophioides** (Fisch.) O. E. Schulz (*Sisymbrium sophioides* Fisch.)

Specimens have been seen from the following localities: Hayes River, 20 miles from York Factory, clay beach (Scoggan, 1949); Hayes River, 10 miles from York Factory, cobble floodplain of island (Scoggan, 1949); York Factory, alluvial soil (Scoggan, 1949); Nelson River, "along lakes and on river banks" (Bell, 1879; specimen determined by Porsild); Churchill (Beckett, 1946, 1948; Gillett, 1948; Core, 1948). The citation of a Back collection from Lake Winnipeg by Macoun [1883] is probably due to an erroneous statement of locality. First report: York Factory [Hooker, 1830].

Arctic western American: n. coast of Alaska, Yukon, and w. Mack. to Victoria I., s. to n. B.C., Great Slave L., and n. Man. A map of the distribution is given by Detling [1939, map 1].

3. D. SOPHIA (L.) Webb (*Sisymbrium sophia* L.; *Sophia multifida* Gilib.)

Sandy and rocky shores and clearings in the southern three-quarters of the province. Northernmost collection seen: Nelson River at Limestone Rapids, about 150 miles south of Churchill, clearing (Scoggan, 1949). Reported from Churchill by Radforth [1950]. Earliest collection seen: Plum Coulee, about 50 miles southwest of Winnipeg (Fletcher, 1901). First report: Lowe [1943].

European: widely naturalized in North America.

4. **D. richardsonii** (Sweet) O. E. Schulz (*Sisymbrium hartwegianum* of auth., not Fourn.)

Prairie and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Buller, 1939; MacKinnon, 1947). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Winnipeg, plains of Manitoba, and Lake Winnipeg Valley [Detling, 1939]. Probable basis of the citation of the Mexican *D. hartwegiana* Fourn. from near Aweme by Criddle [1927].

Subarctic American: south-central Alaska and Great Bear L. to n. Man. and se. Lab., s. to Colo., Kans., Minn., and Me. A map of the greater part of the distribution is given by Detling (1939, map 1].

### 21. BRAYA Sternb. & Hoppe

1. **B. humilis** (C. A. Meyer) Robinson (*Torularia humilis* (Meyer) Schulz)

Specimens have been seen from the following localities: York Factory (Bell, 1880, "rocks along streams"; Scoggan, 1949, clay soil); Limestone River, about 150 miles south of Churchill, muddy soil near river (Schofield, 1950); Churchill (several collections, the first by MacKinnon in 1947). First report: Churchill [Ritchie, 1956]. The Manitoba plant probably belongs to "Race 6" as diagnosed by Abbe [Rhodora 50: 5. 1948], although he notes, of the six races described, that "there is overlapping of all characters to such an extent that it would be unjustifiable to propose them as varieties or perhaps even as forms."

Arctic ?circumpolar (the inclusive species): n. coast of Alaska and w. Mack., Banks I., Victoria I., central Ellesmere I., n. Man., n. shore of L. Superior, Anticosti I., and Nfld., s. to s. B.C., n. Mich., and Vt.; Greenland; Asia. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Böcher [1950].

### 22. Hesperis L.

1. H. MATRONALIS L. Dame's-Violet

Roadsides and clearings, near gardens, in the southern two-fifths of the province. Northernmost collection: The Pas, banks of Saskatchewan River, escaped from cultivation (Krivda, 1949). Earliest collection seen: Pine Ridge, near Winnipeg (Denike, 1939). First report: the present publication.

European: spread from cultivation in North America.

### 23. Erysimum L.

(Treacle-Mustard)

1. Capsules mostly 1·5-2·5 cm. long, green and glabrous or only sparsely pubescent, roundish in cross-section, on filiform pedicels mostly about 1 cm. long; petals 3-5 mm.. long........................................................1. *E. cheiranthoides*
1. Capsules 2-11 cm. long, ashy-pubescent, 4-angled, on short stout pedicels; stems stiff.
    2. Petals 2·5-3 mm. long; capsules 2-5 cm. long; leaves mostly entire or the basal ones sometimes remotely sinuate-toothed..........................2. *E. inconspicuum*
    2. Petals 6-10 mm. long; capsules 6-11 cm. long; stem-leaves entire or remotely sinuate-toothed, the basal ones strongly sinuate-toothed......................3. *E. asperum*

1. E. CHEIRANTHOIDES L. (*Cheirinia cheiranthoides* (L.) Link) Wormseed-Mustard

Rocky or sandy shores and clearings throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by McTavish in 1853). Earliest collection seen: the foregoing McTavish collection. First report: Fort Garry [Schultz, 1861].

Eurasian: widely naturalized almost throughout North America.

2. **E. inconspicuum** (Wats.) MacM. (*Cheirinia inconspicua* (Wats.) Rydb; *E. parviflorum* Nutt., not Pers.)

Dry prairie and sandy or rocky clearings in the southern two-fifths of the province. Northernmost collection: The Pas, railroad gravel (Krivda, 1949). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, dry gravelly soil (Macoun, 1879). First report: "Gravelly soil, near Emerson, Man." [Macoun, 1886]. Basis of the report of *E. lanceolatum* from Red River and "Trader's Rd." by Dawson [1875].

(Arctic-)subarctic American: n. Alaska and coast of Yukon and Mack. to central Man. and e. Que., s. to Nev., Colo., Mo., and N.E. (introd. in the eastern part of the range).

3. **E. asperum** (Nutt.) DC. (*Cheirinia aspera* (Nutt.) Rydb.) Western Wallflower. Prairie-Rocket

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Millwood, about 90 miles northwest of Brandon, dry prairie slope (Scoggan, 1951). Earliest collection seen: Rat Creek, near Portage la Prairie, dry gravelly soil (Macoun, 1872). First report: Pembina Mountain, south of Portage la Prairie [Dawson, 1875].

Temperate western American: s. B.C. to s. Man., s. to N.M., Okla., Kans., and Minn.; in e. Que. and Nfld., the closely related *E. coarctatum* Fern.

## 24. Rorippa Scop.

(Yellow Cress)

1. Leaves merely toothed, the upper and median ones narrowed to a sagittate-clasping base; flowers 3-5 mm. long; capsules globose, 1-3 mm. long, on slender pedicels............ 1. *R. austriaca*
1. Leaves, at least some of the lower ones, deeply parted; capsules subglobose to linear-cylindric.
  2. Leaves pinnately parted into linear or lanceolate, toothed or cut, divisions; capsules 1-2·5 cm. long, slenderly linear-cylindric, on filiform pedicels; rhizomes present............ 2. *R. sylvestris*
  2. Middle and upper leaves coarsely toothed to subentire, the lower leaves usually pinnatifid; capsules 2-9 mm. long; rhizomes wanting.
    3. Capsules slenderly ellipsoid or subcylindric, 3-9 mm. long; stem and leaves mostly glabrous or nearly so............ 3. *R. islandica* var. *fernaldiana*
    3. Capsules subglobose to short ellipsoid, 2-5·5 mm. long; stem and leaves more or less hirsute............ 3a. *R. islandica* var. *hispida*

1. R. austriaca (Crantz) Bess. Austrian Field Cress

Known in the province only from Pilot Mound, about 60 miles southwest of Portage la Prairie, where it was collected in 1939 by H. A. Craig. First report: Pilot Mound [Groh, 1947].

European: locally introduced in temperate North America.

2. R. sylvestris (L.) Bess. Creeping Yellow Cress

Known in the province only from Morden, where it was collected by H. Marshall in 1941. First report: the present publication.

Eurasian: naturalized in temperate eastern North America.

3. **R. islandica** (Oeder) Borbas var. **fernaldiana** Butt. & Abbe (var. *microcarpa* (Regel) Fern.)

Shores, marshy ground, and clearings throughout the province except the northeastern Barren Grounds. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: York Factory (McTavish, 1863-64). First report: Churchill [Radforth, 1950]. Basis of reports of *Nasturtium palustre* DC. from between York Factory and Churchill by Rae [1850], from Winnipeg and N.W. Angle Road by Dawson [1875], from Churchill River by Bell [1880], and from various localities by Macoun [1883], and of *Radicula palustris* and *Rorippa palustris* from the province by Jackson *et al.* [1922] and Lowe [1943], respectively. Probable basis of the citation of *R. sinuata* (Nutt.) Hitchc. from Churchill in the undated supplement to Lowe's 1943 checklist, and of the listing of *Nasturtium officinale* R. Br. by Lowe [1943].

Subarctic American: north-central Alaska to Great Bear L., n. Man., n. Que., se. Lab., and Nfld., s. to Calif., La., Tenn., and Va.; s. Greenland; e. Asia. A map of the northern part of the American distribution is given by Raup [1947, pl. XXVI; var. *microcarpa*].

3a. **R. islandica** var. **hispida** (Desv.) Butt. & Abbe (var. *glabrata* (Lunell) Butt. & Abbe; *R. palustris* var. *hispida* (Desv.) Rydb.)

Similar habitats in the southern three-quarters of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Washow Bay, Lake Winnipeg, water and wet places (Macoun, 1884). First report: Portage la Prairie [Jackson *et al.*, 1922; as *Radicula hispida*].

(Subarctic-)temperate American: B.C. to Nfld., s. to Oreg., N.M., Tex., and Fla.; West Indies.

As noted by Gleason [1952], extreme forms of the above two varieties are easily distinguishable as separate entities, but intermediate forms occur that are more difficult to classify. In addition, the typical form, generally more delicate, and with upper leaves, as well as the lower, pinnatifid, may eventually prove worthy of recognition in our flora.

### 25. ARMORACIA Gaertn., Mey., & Scherb.

1. A. LAPATHIFOLIA Gilib. (*A. rusticana* (Lam.) Gaertn., Mey., & Scherb.) Horseradish

Ditches, moist ground, and waste land in the southern half of the province. Northernmost collection: Flin Flon, moist ground (Scoggan, 1949). Earliest collection seen: Alexander, about 15 miles west of Brandon (Kidd, 1939). First report: Winnipeg [Lowe, 1943].

European: naturalized in temperate North America, spreading from cultivation.

### 26. BARBAREA R. Br.

(Winter-Cress)

1. Upper leaves lyrate-pinnatifid; beak of capsule stout, rarely more than 1 mm. long.... ........ 1. *B. orthoceras*
1. Upper leaves merely angulate or lobed; beak slender, 1.5-3 mm. long......... *B. vulgaris*

1. **B. orthoceras** Ledeb.

Shores and clearings throughout the province except the northeastern Barren Grounds and the southwestern prairie region. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951). Earliest collection seen: Churchill (Beckett, 1946). First report: Reindeer Lake, Cochrane River, and Nueltin Lake [Baldwin, 1953]; but Manitoba is included in the range accredited the species by Fernald [1950]. Probable basis of the citation of *B. praecox* R. Br. from Red River by Bourgeau [in Palliser, 1863], and of *B. vulgaris* var. *stricta* Regel from the shore of Red Deer Lake by Macoun [1883]. Basis of the citation of *B. vulgaris* var. *arcuata* from Norway House by Scoggan [1951].

Subarctic American: n. Alaska to Great Bear L., n. Man., n. Que., se. Lab., and Nfld., s. to Calif., Ariz., Minn., and N.H.; Asia.

*B. vulgaris* R. Br., Common Winter-Cress, is cited from the Ontario boundary area by Lowe [1943], but no supporting specimen has been seen. Its citation from Churchill by Radforth [1950] is probably referable to the foregoing species.

## 27. CARDAMINE L.

### (Bitter Cress)

1. Petals 1-1·5 cm. long; plants chiefly of the Hudson Bay and low-northern regions.
  2. Lateral leaflets of basal leaves ovate to reniform........1. *C. pratensis* var. *palustris*
  2. Lateral leaflets of basal leaves linear to elliptic or oblong.................................................................1a. *C. pratensis* var. *angustifolia*
1. Petals 1·5-4 mm. long.
  3. Stem hispid at base; leaflets of stem-leaves linear-oblanceolate to obovate, their oblique bases decurrent along the rachis, the terminal one usually much the broadest; capsules with slender beaks 0·5-2 mm. long, their seeds 1-1·5 mm. long; plant usually of moist habitats.........................................2. *C. pensylvanica*
  3. Stem glabrous throughout; leaflets of stem leaves linear, not decurrent, the terminal one scarcely broader; capsules beakless or with beak up to 0·7 mm. long, their seeds less than 1 mm. long; plant of dry sandy habitats......3. *C. parviflora* var. *arenicola*

1. **C. pratensis** L. var. **palustris** Wimm. & Grab. Cuckoo-flower

Specimens have been seen from the following localities: Sasaginnigak Lake, about 125 miles northeast of Winnipeg, wet rock shore (Breitung, 1949); York Factory, mossy edge of stream (Scoggan, 1949); Nelson River opposite Gillam Island, about 20 miles west-southwest of York Factory, gravel beach (Scoggan, 1949); Warkworth Creek, about 10 miles south of Churchill (Hughes, 1949); Churchill (several collections, the first seen being one by Dutilly in 1936). First report: the present publication. Probable basis of reports of the main form from near York Factory by Richardson [in Franklin, 1823] and from between York Factory and Churchill by Rae [1850]. The reports of the main form from near Aweme by Criddle [1927] and Lowe [1943] are probably referable to *C. pensylvanica.*

Arctic circumpolar (incl. var. *angustifolia* Hook.): n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to north-central Ellesmereland), n. Que., n. Lab., and Nfld., s. to Alta., Man., Minn., Ill., and Va.; Greenland; Eurasia. A map of the distribution of the inclusive species, on which the occurrence in Manitoba should be indicated, is given by Raup [1947, pl. XXVI].

1a. **C. pratensis** var. **angustifolia** Hook.

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, bog (Schofield, 1950); Churchill (Porsild, 1930; Ford, 1931; Dutilly, 1936). First report: Churchill [Tyrrell, 1897]. Basis of the citation of *C. douglassii* from Churchill by Lowe [1943].

Northern part of the above range.

2. **C. pensylvanica** Muhl.

Damp woods, thickets, shores, and clearings throughout the province, except the extreme north. Northernmost collection: Cochrane River, lat. 58° 38′ N., wet bank (Baldwin, 1951). Earliest collection seen: Assiniboine River, rivulets and around springs (Macoun, 1879). First report: near Aweme [Criddle, 1927]. Probable basis of reports of *C. hirsuta* L. from between York Factory and Churchill [Bell, 1881, 1884].

Subarctic American: south-central Yukon to n. Man., s. James Bay, and Nfld., s. to Oreg., Tex., Ark., and Fla.

3. **C. parviflora** L. var. **arenicola** (Britt.) O.E. Schulz

Specimens have been seen from the following localities: Whiteshell Forest Reserve east of Winnipeg (Leach, 1939; Scoggan, 1951, dry sandy clearing and granite outcrops); Gimli, about 45 miles north of Winnipeg, rocky and barren soil (Groh, 1922); Riding Mountain (Rowe, 1948); Swan River, north of Duck Mountain (Groh, 1922); Flin Flon, granite outcrops (Scoggan, 1951). First report: the present publication. Basis of the report of the main form from rocky situations near the Ontario boundary by Lowe [1943].

Temperate American: s. B.C. to Oreg.; s. Man. to sw. N.B., s. to Tex. and n. Fla.; barely distinct from the Eurasian main form.

### 28. ARABIS L.

### (Rock-Cress)

[*See* Hopkins, 1937; Rollins, 1941.]

1. Plant of the Hudson Bay region, rarely more than 15 cm. high; flowers in close racemes, their petals white; capsules 1-3 cm. long, on erect or ascending pedicels 5-9 mm. long; seeds 2-rowed; base of stem and rosette-leaves pubescent with simple or 2-forked hairs..........1. *A. arenicola* var. *pubescens*

1. Plants of southern and low-northern regions; flowers in loose racemes.

  2. Mature fruiting pedicels pendulous or reflexed; flowering pedicels reflexed or at least somewhat descending.

    3. Lower part of stem finely and minutely hoary-stellate; sepals 1-1·5 mm. broad..........2. *A. holboellii* var. *retrofracta*

    3. Lower part of stem hirsute or hispid with long, spreading, simple and forking hairs; sepals 0·5-0·75 mm. broad..........2a. *A. holboellii* var. *collinsii*

  2. Mature fruiting pedicels and flowering pedicels erect to widespreading, not definitely descending or reflexed.

    4. Seeds definitely in only 1 row.

      5. Stem-leaves linear to spatulate, not clasping; petals white (rarely pink or purplish); fruiting pedicels loosely ascending or spreading; plant much branched from the base..........3. *A. lyrata*

      5. Stem-leaves lanceolate to ovate, sagittate-clasping; fruiting pedicels appressed or subappressed; stem simple below or with only 1 or 2 basal branches.

6. Mature capsules roundish in cross-section, 4-9·5 cm. long, with short thick style; seeds narrowly winged; petals creamy or yellowish; stem-leaves mostly glabrous; stem hirsute at base, glabrous and glaucous above......4. *A. glabra*
6. Mature capsules flat, 1·5-5 cm. long, with usually slender style; seeds broadly winged above; petals whitish or creamy; leaves mostly hirsute; stem hirsute to summit..................................5. *A. hirsuta* var. *pycnocarpa*

4. Seeds in 2 rows; stem-leaves sagittate-clasping.
    7. Fruiting pedicels appressed-ascending or subappressed; plants mostly distinctly glaucous.
        8. Petals creamy or yellowish; capsules roundish in cross-section; rosette-leaves finely stellate-pubescent; stem hirsute at base with spreading, mostly simple hairs....................................................4. *A. glabra*
        8. Petals white to pink (rarely purplish); capsules flat; leaves all glabrous or essentially so; stem glabrous throughout or sparsely hirsute at base.................................................................6. *A. drummondii*
    7. Fruiting pedicels merely ascending to widespreading, never appressed or subappressed; petals pink or purplish (rarely white); rosette-leaves minutely stellate-pubescent, the stem-leaves mostly glabrous; stem sparingly appressed-pubescent at base with forking hairs................................7. *A. divaricarpa*

1. **A. arenicola** (Richards.) Gelert var. **pubescens** (Wats.) Gelert (*A. humifusa* (Vahl) Wats. var. *pubescens* Wats.)

Specimens have been seen from the following localities: York Factory, rocks along streams (Bell, 1880); Churchill (several collections, the first seen being one by Porsild in 1930). First report: York Factory [Hopkins, 1937]. Basis of citations of *A. petraea* Lam. from between York Factory and Churchill by Rae [1850] and from York Factory by Macoun [1883]. Probable basis of the citation of the western *A. nuttallii* Robins. from Churchill in the undated supplement to Lowe's 1943 checklist.

Subarctic (interior) American: L. Athabasca to Chesterfield Inlet, Hudson Bay, s. to n. Man. and James Bay; the main form also in the Can. Arct. Arch. and in Greenland.

2. **A. holboellii** Hornem. var. **retrofracta** (Graham) Rydb. (*A. retrofracta* Graham)

Sandy prairie and clearings in the southern three-quarters of the province. Northernmost collection: Nelson River at Limestone Rapids, about 150 miles south of Churchill, railway clearing (Scoggan, 1949). Earliest collection seen: Vivian, about 25 miles east of Winnipeg (Marquardt, 1932). First report: Burman [1910].

Subarctic American: south-central Alaska and Great Bear L. to north-central Man., Ont., and Que., s. to Calif., Colo., and n. Mich.

2a. **A. holboellii** var. **collinsii** (Fern.) Rollins (*A. pendulocarpa* of auths., not Nels.)

Dry prairie, sandhills, and clearings in the southern three-quarters of the province. Northernmost collection: Tod Lake, 56° 45′ N. (Ritchie, 1955). Earliest collection seen: Brandon (Macoun, 1896). First report: north of

Carberry [Rollins, 1941]. Basis of reports of the main form from the province, and of *A. pendulocarpa* from Carberry, Pine Creek, and Brandon by Hopkins [1937]. Probable basis of the citation of *A. canadensis* L. from Spruce Woods Forest Reserve by Shimek [1927].

Temperate American: Alta. to Man., s. to Wyo. and S.D.; e. Que.

3. **A. lyrata** L.

Specimens have been seen only from Cowan, at the northeast base of Duck Mountain (Criddle, 1931; Scoggan, 1953, sandy jack-pine woods). Reports from southeastern Manitoba [Jackson *et al.*, 1922; Lowe, 1943] and from Carberry [Shimek, 1927] remain to be verified. First report: Burman [1910].

Subarctic American (incl. var. *kamchatica* Fisch.): n. Alaska and Great Bear L. to s. Man., n. shore of L. Superior, and e. coast of Hudson Bay (near Port Harrison), s. to Wash., Mont., s. Sask., Minn., Mo., n. Ga., and N.C.; e. Asia. According to Rollins [1941], "The differences between var. *kamchatica* and var. *typica* are not striking nor invariable".

4. **A. glabra** (L.) Bernh. (*Turritis glabra* L.) Tower-Mustard

Thickets and clearings in the southern three-quarters of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, sandy disturbed areas (Schofield, 1950). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: "Winnipeg, and N.W. Angle Rd." [Dawson, 1875].

Temperate circumpolar: B.C. to Que., s. to Calif. and N.C.; introduced in Alaska; Eurasia.

5. **A. hirsuta** (L.) Scop. var. **pycnocarpa** (Hopkins) Rollins (*A. pycnocarpa* Hopkins)

Sandy prairie, shores, rock outcrops, and clearings in the southern three-quarters of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, sandy railroad bank (Schofield, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Carberry, Brandon, and Fort Ellice [Hopkins, 1937]. Basis of earlier reports of the main form from the province, and of the listing of *A. ovata* by Lowe [1943].

Subarctic American: central Alaska to n. Alta., s. James Bay, and Anticosti I., Que., s. to Calif., Ga., and Pa.; with the main form, circumpolar.

6. **A. drummondii** Gray

Dry prairie, thickets, and clearings in the southern half of the province. Northernmost collection: The Pas, along railroad tracks (Krivda, 1948). Earliest collection seen: Winnipeg (Denike, 1940). First report: Burman [1910].

Subarctic American: sw. Alaska, Mack. R. Delta, and Great Bear L. to central Man., n. shore of L. Superior, south-central Lab., and Nfld., s. to

Calif., N.M., Ia., and Del. Maps of the greater part of the distribution, on which the occurrence of the species in Manitoba should be indicated, are given by Hopkins [1937, map 18] and Raup [1947, pl. XXVI].

7. **A. divaricarpa** Nels. (*A. brachycarpa* (T. & G.) Britt.)

Dry prairie, shores, rock outcrops, and clearings in the southern two-thirds of the province. Northernmost collection seen: Gillam, about 165 miles south of Churchill, sandy soil (Schofield, 1950). Reported from Churchill by Ritchie [1956]. Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Jackson *et al.* [1922]. Basis of reports of *A. confinis* from Lake Winnipeg by Fernald [Rhodora 5: 226. 1903] and from the province by Lowe [1943]. Probable basis of the listing of *A. bourgovii* Rydb. by Lowe [1943].

Subarctic American: south-central Alaska, Mack. R. Delta, and Great Bear L. to north-central Man., n. shore of L. Superior, and e. Que., s. to Calif., Colo., Neb., Mich., and N.E. A map of the greater part of the distribution is given by Hopkins [1937, map 16].

*A. hookeri* Lange (*Halimolobus mollis* (Hook.) Rollins) is represented in the National Herbarium of Canada by a specimen bearing the following data: Grand Rapids, Lake Winnipeg, Anderson, June 17, 1851. No other collection of this northern species appears to have been made in the province since that date, and, in view of the possibility of a confusion of labels, it seems best to exclude it from our flora for the present. A map of the known distribution is given by Böcher [Journal of Ecology 39: 390 (fig. 8). 1951].

### *Cakile* Hill

*C. edentula* (Bigel.) Hook., Sea-Rocket, is reported from the sandy beach at Churchill by Lowe [1943], presumably based upon a so-named collection by Mrs. A. Simpson in 1942. The specimen concerned, however, is referable to *Chrysanthemum arcticum* L.

### *Eruca* Mill.

*E. sativa* Mill., Garden-Rocket, is reported from Manitoba, without definite locality, by Groh & Frankton [1949], but supporting specimens are lacking, and the species should be excluded from our flora.

### *Iodanthus* T. & G.

*I. pinnatifidus* (Michx.) Steud., Purple Rocket, is reported from Pipestone, southwest of Brandon, by Lowe [1943], presumably based upon a so-named collection by Horner in 1924. The specimen concerned, however, is referable to *Raphanus sativus*.

### *Lunaria* L.

*L. annua* L., Honesty, was collected as a garden escape by Bowles in 1926 at Benito, north of Duck Mountain. It is scarcely a naturalized member of our flora.

## 51. RESEDACEAE

(Mignonette Family)

### 1. RESEDA L.

(Mignonette)

1. R. LUTEA L.

Specimens have been seen from Birtle, about 60 miles northwest of Brandon (Townsend, 1950, "spreading fast in rural municipality of Miniota") and Shoal Lake, about 45 miles northwest of Brandon (1940; name of collector not given). Reported also from Beulah and Boissevain by Lowe [1943], as a weed following clover. First report: Birtle [Groh, 1940].

European: naturalized in temperate North America.

## 52. SARRACENIACEAE

(Pitcher-plant Family)

### 1. SARRACENIA L.

**1. S. purpurea** L. Pitcher-plant

Peat bogs, swamps, and muskeg forest in the southern half of the province. Northernmost collection: Bear Lake, north of Oxford Lake (Moore, 1953). Earliest collection seen: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1921). First report: "Prairie Portage" (now Portage la Prairie) [Bourgeau, in Palliser, 1863].

Subarctic American: Great Bear L. to L. Athabasca, central Man., s. Lab., and Nfld., s. to Sask., Minn., Ill., and Del.

## 53. DROSERACEAE

(Sundew Family)

### 1. DROSERA L.

(Sundew)

[*See* Wynne, 1944.]

1. Leaf-blades suborbicular, broader than long; petioles hairy; seeds spindle-shaped, chaff-like, the loose, finely longitudinally striate outer coat prolonged at both ends .......... 1. *D. rotundifolia*
1. Leaf-blades linear to spatulate, much longer than broad; petioles smooth.
    2. Leaf-blades narrowly linear, up to 6 cm. long; seeds rhomboidal, the close outer coat densely shallow-pitted .......... 2. *D. linearis*
    2. Leaf-blades spatulate to narrowly obovate, mostly less than 2·5 cm. long.
        3. Stipules nearly free from the bases of petioles; seeds ellipsoid-obovoid, reddish-brown, densely papillose .......... *D. intermedia*
        3. Stipules adnate to petioles except at tip; seeds spindle-shaped, blackish, the loosely honeycombed outer coat prolonged at both ends .......... D. *anglica*

1. **D. rotundifolia** L. Round-leaved Sundew

Bogs and muskeg forest almost throughout the province except the extreme north. Northernmost collection seen: Reindeer Lake, lat. 57° 37′ N., sphagnum bog (Baldwin, 1951); but reported from Churchill River (near the mouth, according to his itinerary) by Bell [1880]. Earliest collection seen: Treesbank, about 20 miles southeast of Brandon (Fyles, 1914). First report: Churchill River [Bell, 1880].

Subarctic circumpolar: nw. Alaska and Mack. R. Delta to Great Bear L., n. Man., n. Que., central Lab., and Nfld., s. to Calif., Mont., Minn., Ala., and n. Fla.; s. Greenland; Iceland; n. Eurasia. A map of the greater part of the American distribution is given by Wynne [1944, p. 167].

2. **D. linearis** Goldie

The following specimens have been seen: "Between Lake of the Woods and Red River, Man.", muskegs (Dawson, 1873–74; specimen in National Herbarium of Canada); Roseau River, south of Winnipeg, swamp (Dawson, 1873; specimen in herbarium of McGill University). First report: Burman [1910].

(Subarctic-)temperate American: s. Alta. and south-central Sask. to s. Man., e. Que., and Nfld., s. to Minn. and Me. A map of the eastern part of the American distribution is given by Wynne [1944, p. 167].

*D. intermedia* Hayne (*D. longifolia* of Am. auth.) is reported from between Lake of the Woods and Red River by Dawson [1875; as *D. longifolia* L.], from Porcupine Mountain by Macoun [1883; as *D. intermedia* var. *americana* DC.], from Carberry by Christy [1887], and from Riding Mountain by Lowe [1943; as *D. longifolia*]. No specimens have been seen, however, and this species should be excluded from our flora for the present.

*D. anglica* Huds. is reported from Porcupine Mountain by Macoun [1886] and is included by Burman [1910] in his checklist. No specimens have been seen, however; and the species should be excluded from our flora for the present.

## 54. CRASSULACEAE

(Orpine Family)

### 1. SEDUM L.

(Stonecrop)

1. S. TELEPHIUM L.

Known in the province only from The Pas, where it was collected by Krivda in 1951 in a colony growing near a cemetery. First report: the present publication.

Eurasian: naturalized in North America.

## 55. SAXIFRAGACEAE

(Saxifrage Family)

1. Shrubs; fruit a berry tipped by the remains of the calyx..................6. *Ribes*
1. Herbs; fruit a capsule.
    2. Petals wanting, the flowers golden-yellow, 3·5-4.5 mm. broad; bracts 3-5-lobed, yellow, leaf-like; leaves alternate, lobed........................1. *Chrysosplenium*
    2. Petals present; bracts not leaf-like.

3. Flowers solitary.
    4. Flower with 5 palmately cleft gland-tipped structures (staminodia) alternating with the 5 stamens; stigmas 4, sessile; fruit 1-celled...............2. *Parnassia*
    4. Flower without staminodia; stamens 10; styles 2; fruit 2-celled......3. *Saxifraga*
3. Flowers racemose or panicled.
    5. Flowers irregular, glandular-puberulent, the calyx-tube strongly oblique at summit and swollen on one side at base; leaves basal, their blades round-cordate, mostly 3-6 cm. broad, with about 9 strongly toothed shallow lobes, on glandular-hirsute petioles; plant hispid..................................4. *Heuchera*
    5. Flowers regular.
        6. Petals deeply fringed, feather-like; capsule 1-celled; leaves round-cordate to reniform, chiefly basal...........................................5. *Mitella*
        6. Petals entire; capsule 2-celled...............................3. *Saxifraga*

## 1. Chrysosplenium L.

## (Golden Saxifrage)

1. Leaves alternate; stems erect.......................................1. *C. tetrandrum*
1. Leaves mostly opposite; stems decumbent and forking.................*C. americanum*

### 1. **C. tetrandrum** (Lund) Fries (Incl. *C. iowense* Rydb.)

Specimens have been seen from the following localities: Riding Mountain (Sparling, 1938; Rowe, 1948, wet moss of tamarack swamp; Scoggan & Baldwin, 1950, damp woods); Duck Mountain (Scoggan & Baldwin, 1950, mossy edge of woodland stream); Churchill (Gillett, 1948, sedge meadow by stream; Dore, 1949, dripping crevice in rock). First report: Churchill [Hultén, 1944]. Basis of reports of the Eurasian *C. alternifolium* L. from Nunaralaq, north of Churchill, by Gröntved [1936], and from Churchill by Radforth [1950].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to s. Ellesmereland), n. Que., and n. Lab., s. to B.C. and James Bay; Colo.; ne. Ia.; w. Greenland; Spitsbergen; n. Eurasia. A map of the American distribution, on which the occurrence of the species im Manitoba should be indicated, is given by Raup [1947, pl. XXVII]. For discussion, see Hultén [1944] and Rosendahl [Rhodora 49: 25-36. 1947].

*C. americanum* Schwein. is reported from Pine Ridge and Riding Mountain by Lowe [1943], but no specimens have been seen, and it should be excluded from our flora for the present.

## 2. Parnassia L.

## (Grass-of-Parnassus)

1. Leaves cordate at base, a solitary sessile one usually borne below the middle of the scape; petals with 5-9 principal veins, twice the length of the ascending calyx-lobes; staminodia with 9-17 slender cilia.........................................1. *P. multiseta*
1. Leaves tapering to subcordate at base; staminodia with 3-7 terminal cilia or prongs.
    2. Petals shorter than to about equalling the ascending calyx-lobes, 3-veined; leaves all basal, deltoid-ovate or rhombic-ovate..............................2. *P. kotzebuei*
    2. Petals exceeding the calyx-lobes, 5-many-veined.
        3. Petals slightly exceeding to once-and-a-half the length of the ascending calyx-lobes; staminodia bearing 5-7 unequal long cilia; scapes usually bearing a single leaf below or near the middle..........................................3. *P. parviflora*
        3. Petals 3 or more times the length of the calyx-lobes, these latter reflexed in fruit; staminodia cleft nearly to base into 3 stout lance-subulate prongs; scapes naked or with 1 sessile leaf near base...........................................4. *P. glauca*

1. **P. multiseta** (Ledeb.) Fern. *P. palustris* L. var. *neogaea* Fern.) [*See* Löve, Botaniska Notiser 1950: 40–44. 1950;]. Acta Soc. Fauna et Flora Fennica 72: 9–10 1955.

Meadows, shores, muskeg forest, and damp clearings throughout the province except the northeastern Barren Grounds. Northernmost collection: Churchill (several collections, the first seen being one by Macoun in 1910); but reported from there by Tyrrell [1897]. Earliest collection seen: Grindstone Point, north of Hecla Island, Lake Winnipeg (Macoun, 1884). First report: Churchill [Fernald, Rhodora 28: 212. 1926; as *P. multiseta*].

(Arctic-)subarctic circumpolar: n. Alaska, Mack. R. Delta, and n. coast of Mack. to s. Keewatin, n. Que., n. Lab., and Nfld., s. to Oreg., Wyo., N.D., and e. Que.; Eurasia. A map of the American distribution is given by Raup [1947, pl. XXVII]. One of the circumpolar distribution is given by Löve, Botaniska Notiser 1950: 41 (fig. 10). 1950.

2. **P. kotzebuei** Cham.

Known in the province from only the following localities: Cochrane River, lat. 58° 38′ N., wet bank (Baldwin, 1951); Churchill (several collections, the first by MacKinnon in 1947). First report: Churchill [Radforth, 1950].

(Arctic-)subarctic American: n. coast of Alaska, Yukon, and Mack., s. Baffin I., n. Que., n. Lab., and Nfld., s. to s. B.C., Wyo., James Bay, and e. Que.; e. Greenland; ne. Asia. Maps of the American distribution, on which the occurrence of the species in Manitoba should be indicated, are given by Fernald [1925, p. 248, map 3 (incomplete)] and Raup [1947, pl. XXVII].

3. **P. parviflora** DC.

Known in the province only from Hargrave River near Hill Lake, about 30 miles north of Lake Winnipeg, where it was collected by the writer in 1948 on a sandy ridge near the Palæozoic-Precambrian contact about 8 miles from the river mouth. First report: the present publication.

Subarctic American: ?Alaska, south-central Yukon, Great Bear L., and B.C. to s. Lab. and Nfld., s. to Utah, Colo., S.D., Wisc., Ont., and P.E.I.

4. **P. glauca** Raf. (*P. caroliniana* of auth., not Michx.; *P. americana* Muhl.)

Specimens have been seen from the following localities: Sundown, about 70 miles southeast of Winnipeg, swampy ground (Scoggan, 1953); Caliento, about 60 miles southeast of Winnipeg, wet sedge prairie (Dore, 1948); Muskeg Portage, Roseau River, southeast of Winnipeg, swamp (Dawson, 1873); Stony Mountain, near Winnipeg, boggy ground (Macoun, 1896); Shilo, about 15 miles east of Brandon (Lowe, 1943; Given, 1943); Virden, about 45 miles west of Brandon (Groh, 1922). First report: Flin Flon and Shilo [Lowe, 1943; as *P. americana* (the Flin Flon citation is probably referable to *P. multiseta*, but the specimen has not been seen)]. Basis of earlier reports of *P. caroliniana* from the province.

(Subarctic-)temperate eastern American: Man. to Nfld., s. to S.D., n. Ill., and Pa.

## 3. SAXIFRAGA L.

## (Saxifrage)

1. Flowering stems leafless, merely bearing small bracts, erect and soft; rosette-leaves about 1-8 cm. long, ovate; flowers white, in a loose panicle..................1. *S. virginensis*
1. Flowering-stems or peduncles leafy.
  2. Leaves 3-5 mm. long, leathery, bristly-ciliate, 4-ranked on the densely matted trailing branches, with 1-3 terminal lime-encrusted pores; flowers lilac or purple; plant of the Hudson Bay region......................................2. *S. oppositifolia*
  2. Leaves longer, without lime-encrusted pores; flowers yellow or white.
    3. Leaves entire; flowers yellow; plants of the Hudson Bay region.
      4. Flowers usually solitary; petals 9-13 mm. long; follicles 12-16 mm. long; leaves elliptic or elliptic-spatulate, the basal ones long-petioled..........3. *S. hirculus*
      4. Flowers usually several in terminal cymes; petals 3-4·5 mm. long; follicles 6·5-8 mm. long; leaves linear to oblong, fleshy, obtuse, with a minute pore below the short terminal point........................................4. *S. aizoides*
    3. Leaves, or at least most of them, toothed or lobed.
      5. Leaves rigid, cuneate-oblanceolate, ciliate, mostly 3-toothed at apex, the teeth firm and tough, spine-tipped; flowers creamy or yellowish-white, in a loose corymb ....................................................5. *S. tricuspidata*
      5. Leaves soft, most of them palmately 3-5-lobed; flowers white; plants of the Hudson Bay region.
        6. Stems mostly closely matted and persistent, only the slender glandular flowering ones erect; leaves obovate-cuneate or fan-shaped, ciliate.............................................................6. *S. cespitosa*
        6. Stems tufted and delicate, 1-3-leaved; rosette-leaves reniform, on filiform petioles, non-ciliate......................................7. *S. rivularis*

1. **S. virginiensis** Michx. (*Micranthes virginiensis* (Michx.) Small) Early Saxifrage

Specimens have been seen from the following localities: Whiteshell Forest Reserve east of Winnipeg (Lowe, 1921; Cox, 1921; Leach, 1939; Brooks, 1942; Scoggan, 1953, jack-pine woods on granite outcrops); near Winnipeg, sandy soil (Denike, 1939); Lee River, 85 miles northeast of Winnipeg, moss on rocks (Quelch, 1950). First report: Birds Hill, Pine Ridge, Brereton, and Victoria Beach [Lowe, 1943].

Temperate eastern American:s. Man. to Que., s. to Mo., Tenn., and Ga.

2. **S. oppositifolia** L. (*Antiphylla oppositifolia* (L.) Fourr.) Purple Mountain-Saxifrage

Known in the province only from Churchill, the earliest collection seen being one made by Polunin in 1934. It is a plant of barren, exposed habitats. First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to central Ellesmereland), n. Que., n. Lab., and Nfld., s. to Wash., Wyo., James Bay, and n. Vt.; Greenland; Iceland; Spitsbergen; n. Eurasia. Maps of the American distribution are given by Fernald [Rhodora 35: 7. 1933] and Raup [1947, pl. XXVII].

3. **S. hirculus** L. (*Leptasea hirculus* (L.) Small) [*See* key in Hultén, 1944].

Specimens have been seen from the following localities: York Factory (Bell, 1879; Scoggan, 1949, muskeg forest of black spruce and tamarack);

Churchill (several collections, the earliest seen being one by Bell in 1879 bearing the annotation "Churchill River, rocky shore", but presumably collected near Churchill according to Bell's outline of his itinerary). First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), to n. Que., s. to sw. Alaska, n. Man., and n. James Bay; isolated in Colo. and ?Utah; Greenland; Iceland; Spitsbergen; n. Eurasia.

4. **S. aizoides** L. (*Leptasea aizoides* (L.) Haw.) Yellow Mountain-Saxifrage

Known in Manitoba from the following localities: Lamprey, about 45 miles south of Churchill, peaty soil (Brown, 1950); Churchill (several collections, the first by Macoun in 1910). It is a species of damp, gravelly soils and tundra habitats. First report: Churchill [Gröntved, 1936].

Arctic amphi-Atlantic: south-central Yukon, n. coast of Mack., Can. Arct. Arch. (to Ellesmereland), n. Que., n. Lab., and Nfld., s. to s. B.C., James Bay, and N.Y.; Greenland; Iceland; Spitsbergen; n. Europe; nw. Asia. A map of the distribution is given by A. and D. Löve [Svensk Botanisk Tidskrift 45: 378. 1951], and of the American area by Raup [1947, pl. XXVII].

5. **S. tricuspidata** Rottb. (*Leptasea tricuspidata* (Rottb.) Haw.)

Rock outcrops and rocky shores in the northern half of the province except the northeastern Barren Grounds, and, less abundantly, in the Precambrian formation east of Lake Winnipeg to Lake of the Woods. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel ridge (Baldwin, 1951). Earliest collection seen: Lake Winnipeg (Richardson; specimen undated, but presumably collected during the Franklin expeditions of 1819-22; the earliest dated specimen seen is one taken at Churchill by McTavish in 1853). First report: Lake Winnipeg and Hudson Bay [Hooker, 1833]. Basis of the citation of *S. aizoön* Jacq. (*Chondrosea aizoön* (Jacq.) Haw.) from Flin Flon by Lowe [1943]. The Riding Mountain specimen has not been seen.

Arctic American: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., and n. Lab., s. to B.C., s. Man., Isle Royale, James Bay, and south-central Lab.; Greenland.

Forma *subintegrifolia* (Abromeit) Polunin, with subentire leaves, is represented by a collection at Flin Flon in 1937 by Mrs. R. Sparling. It is also cited from Churchill River between Missi Falls and the mouth of Little Churchill River by Alcock [1916].

6. **S. cespitosa** L. (*Muscaria cespitosa* (L.) Haw.)

Known in Manitoba only from Churchill, the earliest collection seen from that locality being one made by Porsild in 1930. It is a species of gravelly and rocky shores. First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar (the collective species): n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to central Ellesmereland), n. Que., n. Lab., and Nfld., s. to Colo., n. Man., James Bay, and e. Que.; Greenland; Iceland; Spitsbergen; n. Eurasia. A map of the distribution is given by A. and D. Löve [Svensk Botanisk Tidskrift 45: 382. 1951].

7. **S. rivularis** L. Alpine-brook-Saxifrage

Known in the province only from Churchill (Porsild, 1930; Gillett & Tilt, rocks, 1948; Gillett & Cody, rock ridge, 1948; Dore, quartzite rocks, 1949; Beckett, 1953). First report: Raup [1947, map of American distribution, pl. XXVI, showing Churchill station].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., n. Lab., and Nfld., s. to Mont., n. Man., and N.H.; Greenland; Iceland; Spitsbergen; n. Eurasia.

*S. cernua* L.: the citation from Churchill by Tyrrell [1897] is probably referable to the foregoing species.

### 4. HEUCHERA L.

(Alumroot)

1. **H. richardsonii** R. Br. (Incl. var. *hispidior* Rosend., Butt., & Lak.)

Dry, rocky or sandy, prairie and shores throughout the southern half of the province. Northernmost collection: Oxford Lake, rocky shore (Scoggan, 1949). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873). First report: Red River prairie [Dawson, 1875]. Basis of reports of the southeastern American *H. hispida* from the province.

(Subarctic-)temperate western American: sw. Mack. to central Man., s. to Wyo., Colo., and Neb.

### 5. MITELLA L.

(Mitrewort. Bishop's-cap)

1. Stem-leaves solitary or none; flowers yellowish green, 7-11 mm. wide; stems 5-20 cm. tall........1. *M. nuda*
1. Stem-leaves a single opposite pair; flowers white, 5-6 mm. wide; stems up to 4 dm. tall........*M. diphylla*

1. **M. nuda** L.

Cool, mossy woods or swamps throughout the province except the extreme north. Northernmost collection: Mosquito Point, 7 miles north of Churchill (Porsild, 1930). Earliest collection seen: York Factory (McTavish, 1854). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Subarctic American: s. Alaska to sw. Mack., s. Keewatin, James Bay, s. Lab., and Nfld., s. to Mont., N.D., Minn., and Pa.; e. Asia.

*M. diphylla* L., Coolwort, is included by Burman [1910] in his checklist, but no specimens have been seen, and it should be excluded from our flora for the present.

## 6. RIBES L.

(Currant. Gooseberry)

1. Flowers in elongate racemes, their pedicels jointed below the ovary, the fruit disarticulating.
2. Leaves resinous-dotted beneath; stems unarmed; ovary and fruit smooth.
3. Calyx white, 4-5 mm. long, its free segments exceeding the length of the tube; racemes erect or ascending, their short bracts soon deciduous...1. *R. hudsonianum*
3. Calyx yellow and whitish, its lobes and tube subequal; racemes drooping, their elongate bracts persistent..........2. *R. americanum*
2. Leaves not resinous-dotted.
4. Stems armed with bristles and prickles; racemes drooping, their purplish-black fruits glandular-bristly..........3. *R. lacustre*
4. Stems unarmed.
5. Ovary and red fruit glandular-bristly; caylx whitish to roseate; leaves deeply cordate, 5-7-lobed, the lobes doubly serrate; plant with fetid odour..........4. *R. glandulosum*
5. Ovary and fruit smooth; pedicels with capitate glands; calyx smoke-colour to purplish; leaves somewhat cordate, their sides nearly parallel, the lobes mostly broad-deltoid..........5. *R. triste*
1. Flowers solitary or in clusters of 2-4, their pedicels not jointed below the smooth ovary.
6. Bracts finely glandular-ciliate; glands usually intermixed with pubescence on lower leaf surface; stamens about equalling the petals; nodal spines usually present, the internodes also commonly spiny..........6. *R. oxyacanthoides*
6. Bracts villous-ciliate, they and the leaves non-glandular; stamens somewhat exceeding the petals; nodal spines (when present) few and weak, the internodes often unarmed.
7. Leaves merely pilose on the nerves beneath.
8. Leaf-blades cuneate to cuneate-truncate at base..........7. *R. hirtellum*
8. Leaf-blades rounded to cordate at base..........7a. *R. hirtellum* var. *saxosum*
7. Leaves densely soft-pubescent beneath, subtruncate to cordate at base..........7b. *R. hirtellum* var. *calcicola*

### 1. **R. hudsonianum** Richards.

Thickets, woods, and rock outcrops throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: York Factory, (McTavish, 1853 or 1854). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Subarctic American: north-central Alaska, Mack. R. Delta, and Great Bear L. to n. Man. and north-central Que., s. to Oreg., Utah, Wyo., Sask., ne. Ia., Mich., and se. Ont. A map of the distribution is given by Raymond. [1950, fig. 5].

### 2. **R. americanum** Mill. (*R. floridum* L'Hér.) Wild Black Currant

Thickets, woods, and rock outcrops in the southern half of the province. Northernmost collection: Hill Lake, north of Lake Winnipeg, limestone shingle beach at entrance of Minago River (Scoggan, 1948). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, thickets (Burgess, 1873). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Temperate American: Alta. to N.B., s. to N.M., Neb., Mo., and Del.

3. **R. lacustre** (Pers.) Poir. (*Lymnobotrya lacustris* (Pers.) Rydb.) Bristly Black Currant

Thickets, woods, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Rogers in 1936). Earliest collection seen: York Factory (McTavish, 1853 or 1854). First report: Lake Winnipeg [Macoun, 1877].

Subarctic American: central Alaska to n. Man., s. Lab., and Nfld., s. to Calif., Colo., Minn., n. O., and N.Y., and mts. of Tenn.

4. **R. glandulosum** Grauer (*R. prostratum* L'Hér.) Skunk Currant

Thickets, woods, rock outcrops, and clearings throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., foot of gravel ridge (Baldwin, 1951). Earliest collection seen: Hayes River (Richardson; specimen undated, but presumably collected during the Franklin expeditions of 1819–22; the earliest dated specimen seen is one from Lake Winnipegosis (Macoun, 1881, cold damp woods and rocks). First report: Lake Winnipeg and Nelson River [Bell, 1880].

(Arctic-)subarctic American: central Alaska and central Yukon to s. Keewatin, n. Que., n. Lab., and Nfld., s. to B.C., Minn., n. O., and mts. to N.C. A map of the greater part of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXVIII].

5. **R. triste** Pall. (Incl. var. *albinervium* (Michx.) Fern.) Red Currant

Thickets, woods, shores, and rock outcrops throughout the province, except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet black spruce woods (Baldwin, 1951). Earliest collection seen: Winnipeg, swamps (Dawson, 1873–74). First report: Jackson *et al.* [1922]. Basis of reports of *R. rubrum* L. from Winnipeg and N.W. Angle Road by Dawson [1875] and from the province by Burman [1910].

Subarctic American: n. Alaska, Mack. R. Delta, and Great Bear L. to s. Keewatin, north-central Que., s. Lab., and Nfld., s. to Oreg., S.D., Minn., and Pa.; e. Asia. A map of the greater part of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXVIII].

6. **R. oxyacanthoides** L. (*Grossularia oxyacanthoides* (L.) Mill.)

Thickets, woods, shores, rock outcrops, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: York Factory (McTavish, 1853–54). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880]. Basis of the citation of *R. cynosbati* L. from Pembina Mountain by Dawson [1875; *see* Macoun, 1886, p. 527], and of *R. setosum* Lindl. from Lake Winnipeg by Macoun [1886].

Subarctic American: south-central Yukon and Great Bear L. to n. Man. and James Bay, s. to Mont., S.D., and n. Mich. A map of the greater part of the American distribution is given by Raup [1947, pl. XXVII].

7. **R. hirtellum** Michx. (*Grossularia hirtella* (Michx.) Spach)

Thickets, woods, and clearings in the southern third of the province. Northernmost collection: Berens River, east coast of Lake Winnipeg, rocky banks (Macoun, 1886). Earliest collection seen: Pembina Mountain, south of Winnipeg, thicket (Dawson, 1873–74); basis of citations of *Grossularia setosa* (Lindl.) Cov. & Britt. from Pembina Mountain by Jackson *et al.* [1922] and Lowe [1943]. First report: "Manitoba" [Coville & Britton in N. Am. Fl. 22: 225. 1908].

(Subarctic-)temperate eastern American: e. Sask. to s. Lab. and Nfld. s. to Minn. and Pa.

7a. **R. hirtellum** var. **saxosum** (Hook.) Fern.

Specimens have been seen from the following localities: "Lake Winipeg Valley" (Bourgeau, 1857; specimen in Gray Herbarium of Harvard University, determined by Fernald); Moosehorn, about 90 miles north of Portage la Prairie, white spruce woods (Scoggan, 1951). First report: the present publication; but "s. Man." is included in the range given by Fernald [1950].

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to N.D. and Me.

7b. **R. hirtellum** var. **calcicola** Fern.

The following is the only specimen seen: Turtle Mountain, damp aspen grove by Max Lake (Scoggan & Baldwin, 1950). First report: the present publication.

(Subarctic-)temperate eastern American: s. Man. to s. Lab., s. to Wisc. and Mass.

### *Penthorum* L.

*P. sedoides* L., Ditch-Stonecrop, is cited from the banks of Red River at St. Vital, near Winnipeg, in the undated supplement to Lowe's 1943 checklist. No specimens have been seen, however, and it should be excluded from our flora for the present.

## 56. ROSACEAE

### (Rose Family)

1. Fruit consisting of usually 5 dry follicles splitting down one side; flowers small and numerous in an elongated panicle, white or roseate; shrubs with simple toothed leaves ........................................................ 1. *Spiraea*

1. Fruit indehiscent, consisting of 2-many dry achenes (these sometimes on very fleshy enlarged receptacles, or seed-like within the enlarged calyx-tube) or fleshy several-seeded pomes or 1-seeded drupes (these last sometimes small and berry-like); herbs or shrubs (sometimes small trees) with simple or compound leaves.

2. Fruit consisting of dry achenes.

3. Achenes seed-like within the persistent calyx-tube; leaves pinnately compound.

4. Calyx-tube indurated in fruit and enclosing 2 achenes, its throat armed with hooked bristles; larger leaflets separated by smaller ones on the intervals of the axis; herbs with small yellow flowers in spike-like racemes.........2. *Agrimonia*

4. Calyx-tube swollen and fleshy in fruit, enclosing numerous achenes; leaflets rather uniform in size; shrubs with large whitish, pink, or roseate flowers...3. *Rosa*

3. Achenes superficial on the dry or fleshy receptacle.

5. Receptacle much enlarged and fleshy or pulpy in fruit; flowers white; leaves all basal, of 3 coarsely toothed leaflets..................................4. *Fragaria*

5. Receptacle dry, little enlarged in fruit.

6. Stems leafless, the solitary large white or yellowish flowers on slender scapes; mature achenes tipped by the long, persistent, feathery styles; basal leaves ovate-lanceolate, essentially entire, green and shining above, white-tomentose beneath..................................................5. *Dryas*

6. Stems leafy.

7. Styles persistent and elongated in fruit, feathery or jointed (if jointed, the upper segment deciduous); leaves pinnate, with smaller leaflets alternating with the larger ones...........................................6. *Geum*

7. Styles not elongated in fruit, mostly deciduous; leaves digitate or pinnate (if pinnate, mostly without alternating smaller leaflets).

8. Stamens 5, opposite the white to purplish petals; leaves 3-foliate, the leaflets cleft into linear segments; plant glandular-pubescent.....................................................7. *Chamaerhodos*

8. Stamens numerous (5 in *P. pentandra*); flowers relatively large, mostly yellow, sometimes white or purple; leaves digitate or pinnate.....................................................8. *Potentilla*

2. Fruit consisting of several-seeded pomes or 1-seeded drupes (both of these often small and berry-like).

9. Fruit a 1-seeded drupe or a collection of drupelets.

10. Fruit a collection of drupelets on a dry or spongy receptacle; leaves simple or compound...................................................9. *Rubus*

10. Fruit consisting of solitary drupes with a bony stone; leaves simple.....................................................10. *Prunus*

9. Fruit a large or small several-seeded pome.

11. Pomes relatively large ("haws"), with 1-5 bony usually 1-seeded nutlets; leaves simple, toothed or lobed; branches armed with long stout thorns....11. *Crataegus*

11. Pomes small and berry-like.

12. Leaves simple; flowers clustered or racemose..............12. *Amelanchier*

12. Leaves pinnate; flowers cymose..............................13. *Sorbus*

## 1. SPIRAEA L.

### (Spiraea)

1. Petals white; leaves green both sides..................................1. *S. alba*

1. Petals roseate; leaves densely tomentose beneath........................*S. tomentosa*

1. **S. alba** Du Roi (*S. salicifolia* of auth., not L.) Meadow-Sweet

Prairie, thickets, shores, rock outcrops, and clearings throughout the southern half of the province. Northernmost collection: Norway House, off the northeast end of Lake Winnipeg, rock outcrops (Scoggan, 1948). Earliest collection seen: Pembina Mountain, south of Portage la Prairie, open prairie (Burgess, 1873). First report: Jackson *et al.* [1922]. Basis of reports of the Eurasian *S. salicifolia* L. from the province.

Temperate eastern American: se. Sask. to sw. Que., s. to N.D., n. Mo., O., and N.C.

*S. tomentosa* L., Hardhack or Steeple-bush, is cited from Lake Winnipeg by Hooker [1833], based upon a collection by Richardson, presumably during the Franklin expeditions of 1819–22. There is a duplicate in the National Herbarium of Canada bearing the annotation "Lake Winnipeg", this number (5736) probably being the basis for the inclusion by Fernald [1950] of Manitoba in the range of var. *rosea* (Raf.) Fern. No later collections appear to have been made, however, and it seems unwise to admit the species to our flora on the basis of this single very early collection, the locality of which is probably open to question. It is not accredited to Manitoba in the map given by Braun [Rhodora 39: 199 (map 24). 1937].

## 2. Agrimonia L.

## (Agrimony)

1. Rachis of inflorescence non-glandular, densely pilose; hooked bristles of fruit ascending from a narrow base.......................................1. *A. striata*
1. Rachis of inflorescence glandular-puberulent; hooked bristles of fruit spreading from a thin horizontal flange, the lower ones often reflexed..................*A. gryposepala*

### 1. **A. striata** Michx.

Thickets and woods of southern Manitoba. Northernmost collection: Minitonas, north of Duck Mountain (Groh, 1934). Earliest collection seen: Lake Winnipeg (Richardson, specimen undated, but presumably collected during the Franklin expeditions of 1819–22; the earliest dated collection seen is one taken by Schultz along the Assiniboine River in 1861). First report: near Carberry [Shimek, 1927, p. 28]. Basis of reports of the European *A. eupatoria* L. from the province by Hooker [1833], Dawson [1875], and Burman [1910].

(Subarctic-)temperate American: B.C. to Nfld., s. to Ariz., N.M., Neb., W. Va., and Pa.

*A. gryposepala* Wallr. is reported from the province by Jackson *et al.* [1922] and Lowe [1943], but all so-named specimens seen have proved referable to the foregoing species.

## 3. Rosa L.

## (Rose)

[*See* Breitung, Naturaliste Canadien 79: 184-188. 1952.]

1. Prickles present at base of stipules, longer and stouter than those of the internodes; leaflets 5-9, elliptic-obovate; flowers mostly corymbed, about 3 cm. broad.......................................1. *R. woodsii*
1. Prickles absent at base of stipules, or not clearly differentiated; flowers 4-6 cm. broad.
    2. Canes low, semi-herbaceous, mostly dying back; leaflets 9-11; flowers corymbose.......................................2. *R. arkansana*
    2. Canes woody, taller.
        3. Canes unarmed or with a few scattered prickles; leaflets 5-7(-9); margins of stipules rarely glandular; flowers solitary or corymbose........................3. *R. blanda*
        3. Canes densely bristly and prickly; leaflets 3-7; margins of stipules glandular; flowers mostly solitary.......................................4. *R. acicularis*

### 1. **R. woodsii** Lindl. (Incl. *R. macounii* Greene)

Prairie, thickets, and clearings in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, clearing

(Scoggan, 1948). Earliest collection seen: Winnipeg (Higham, 1922). First report: Napinka and Winnipeg [Lowe, 1943].

Subarctic western American: central Alaska to n. Alta. and central Man., s. to B.C., Utah, Kans., and N.D.

2. **R. arkansana** Porter (Incl. var. *suffulta* (Greene) Cock.; *R. pratincola* Greene; *R. alcea* Greene; *R. subglauca* Rydb.; *R. lunnellii* Greene)

Prairie and clearings in the southern quarter of the province. Northernmost collection: Gypsumville, about 125 miles north of Portage la Prairie (Freedman, 1950). Earliest collection seen: "Little Saskatchewan, Man.", presumably the present-day Minnedosa River south of Riding Mountain, dry soil (Macoun, 1872). First report: Burman [1910].

Temperate American: B.C. to N.Y., s. to N.M., Tex., Kans., Mo., Ind., and D.C.

3. **R. blanda** Ait. (*R. subblanda* Rydb.)

Thickets, woods, and shores in the southern two-fifths of the province. Northernmost collection seen: Grand Rapids, near the northwest end of Lake Winnipeg, clearing on limestone substratum (Scoggan, 1948). The citations from York Factory and "Echimamish River to Oxford House" by Bell [1881] remain to be verified. Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Dawson, 1873). First report: Fort Garry [Schultz, 1861]. Basis of the report of *R. stricta* Lindl. from Fort Garry by Macoun [1877].

(Subarctic-)temperate American: sw. Mack. to central Man., James Bay, and e. Que., s. to B.C., Neb., and Pa.

4. **R. acicularis** Lindl.

Thickets, woods, rock outcrops, and clearings throughout the province except the extreme north. Northernmost collection: Warkworth Creek, about 10 miles south of Churchill, railroad gravel (Gillett, 1948). Earliest collection seen: High Bluff, near Portage la Prairie (Hargrave, 1883). First report: Carberry, sandhills [Christy, 1887; but probably referable to *R. arkansana*].

Subarctic American: n. Alaska to Great Bear L., n. Man., and central Que., s. to Colo., S.D., and N.E.; e. Asia. A map of the greater part of the distribution is given by Raup [1947, pl. XIX].

## 4. FRAGARIA L.

(Strawberry)

1. Leaflets subsessile, their teeth divergent, the terminal tooth of each leaflet commonly projecting beyond a line joining the tips of the two adjacent teeth; achenes superficial; calyx-lobes spreading or reflexed ........................ 1. *F. vesca* var. *americana*

1. Leaflets on short petiolules, their teeth somewhat ascending, the terminal one commonly shorter than the two adjacent ones; achenes in pits; calyx-lobes ascending about the young fruit.
    2. Pubescence of scapes and petioles loosely spreading .................. 2. *F. virginiana*
    2. Pubescence of scapes and petioles appressed or ascending ........................ 2a. *F. virginiana* var. *terrae-novae*

1. **F. vesca** L. var. **americana** Porter (*F. americana* Britt.) Woodland Strawberry

Thickets, woods, and clearings in the southern three-fifths of the province. Northernmost collection: Knee Lake, clearing by cabins (Scoggan, 1949). Earliest collection seen: Winnipeg, thickets (Dawson, 1873-74). First report: Jackson *et al.* [1922]. Basis of reports of the main form from the province.

Temperate American: B.C. to e. Que., s. to N.M., Neb., Mo., and Va.

2. **F. virginiana** Duchesne (Incl. *F. canadensis* Michx.)

Thickets, prairie, rock outcrops, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873). First report: Dufferin [Dawson, 1875].

(Subarctic-)temperate American: B.C. to Nfld., s. to Okla. and Ga.

2a. **F. virginiana** var. **terrae-novae** (Rydb.) Fern. & Wieg. (Incl. *F. glauca* (Wats.) Rydb. and *F. pauciflora* Rydb.)

Similar habitats throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Polunin in 1936). Earliest collection seen: York Factory (McTavish, 1854). First report: Lowe [1943].

Subarctic American: central Alaska and Great Bear L. to n. Man., s. Lab., and Nfld., s. to N.M., S.D., and N.E. A map of the greater part of the distribution of *F. glauca* is given by Raup [1947, pl. XXVIII].

## 5. DRYAS L.

(Dryas)

1. **D. integrifolia** Vahl

Known in the province only from Churchill, the earliest collection seen being one made by Macoun in 1910. There is a specimen in the National Herbarium of Canada purportedly from Flin Flon (Gardner, 1930), but it is probable that a confusion of labels is involved. First report: between York Factory and Churchill [Rae, 1850]. Basis of the citation of *D. octopetala* L. from Churchill by Lowe [1943].

Arctic American: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., n. Lab., and Nfld., s. to Mont., n. shore of L. Superior, and e. Que.; circumgreenlandic. Maps of the distribution are given by Raup [1947, pl. XXIX] and Porsild [Can. Field-Nat. 61: 183. 1947].

## 6. GEUM L.

(Avens)

1. Styles not jointed, continuous and wholly persistent; flowers purple, nodding; leaves mostly basal; chiefly dry prairie habitats.......................... 1. *G. triflorum*

1. Styles jointed and bent near or above the middle, the upper segment deciduous from the finally hooked lower segment; stem-leaves little reduced.

2. Calyx purple; flowers nodding, their yellowish to purplish petals abruptly contracted to the claw; styles plumose........................................2. *G. rivale*
2. Calyx green; flowers ascending, their yellow to orange petals gradually narrowed at base; styles not plumose.
    3. Receptacles long-hirsute; styles glandless; peduncles clavate at summit; calyx-lobes 5-9 mm. long..............................3. *G. aleppicum* var. *strictum*
    3. Receptacles glabrous or short-hispid; styles minutely glandular at base; peduncles filiform; calyx-lobes 2·5-5 mm. long..........4. *G. macrophyllum* var. *perincisum*

1. **G. triflorum** Pursh (*Sieversia triflora* (Pursh) R. Br.)

Prairie and clearings in the southern fifth of the province. Northernmost collection: Duck Mountain, roadside clearing (Scoggan & Baldwin, 1950). Earliest collection seen: Dufferin, near Carman, 45 miles southwest of Winnipeg, open prairie (Burgess, 1873). First report: Red River prairie [Dawson, 1875]. Basis of the listing of *Sieversia ciliata* (Pursh) Don by Jackson *et al.* [1922] and Lowe [1943].

(Subarctic-)temperate western American: central B.C. and n. Alta. to south-central Man., s. to Mont., Neb., Ia., and Ill.

2. **Geum rivale** L. Purple Avens

Wet meadows, swamps, and woods in the southern quarter of the province. Northernmost collection seen: Duck Mountain, swampy ground (Scoggan & Baldwin, 1950). Earliest collection seen: Vivian, about 25 miles east of Winnipeg (Simpson, 1934). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880]. This northern citation remains to be verified.

Subarctic circumpolar: central B.C. to n. Que. and Nfld., s. to N.M., Minn., Ill., and Pa; Iceland; Eurasia.

3. **G. aleppicum** Jacq. var. **strictum** (Ait.) Fern. (*G. strictum* Ait.)

Thickets, meadows, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Gardner, 1930). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1857). First report: Winnipeg and N.W. Angle Road [Dawson, 1875].

(Subarctic-)temperate American: sw. Mack. to n. Man., James Bay, and e. Que., s. to Mex., N.M., Neb., W. Va., and Pa.

4. **G. macrophyllum** Willd. var. **perincisum** (Rydb.) Raup

Woods, thickets, and clearings throughout the province except the extreme north and the southwestern prairie region. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: "Lake Winipeg Valley" (Bourgeau, 1857). First report: Raup [Rhodora 33: 175 (fig. 2). 1931, map showing station at south end of Lake Winnipeg]. Basis of reports of the main form from the province.

Subarctic American: central Alaska and Great Bear L. to n. Man., s. to Calif., n. Mich., and n. shore of L. Superior. A second map showing the greater part of the distribution is given by Raup [1947, pl. XXIX].

## 7. CHAMAERHODOS Bunge

1. **C. erecta** (L.) Bunge subsp. **nuttallii** (Pickering) Hult. (*C. nuttallii* Pickering)

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Bield, near the northwest edge of Riding Mountain, about 50 miles west of Dauphin, isolated prairie slopes (Scoggan, 1951). Earliest collection seen: "Manitoba" (Macoun, 1872). First report: Jackson *et al.* [1922]. Basis of reports of the main form from the province.

(Subarctic-)temperate American: south-central Yukon to s. Man., s. to Colo., N.D., and w. Minn.; var. *keweenawensis* in n. Mich. Barely separable from the eastern Asiatic main form. A map of the greater part of the distribution is given by Fernald [Rhodora 37: 214 (map 10). 1935].

## 8. POTENTILLA L.

### (Cinquefoil. Five-finger)

1. Leaves digitate.
2. Leaflets 3 (at least in the lower leaves).
3. Flowers white; achenes densely hairy; leaflets coarsely 3(-5)-toothed at apex, leathery in texture..........1. *P. tridentata*
3. Flowers yellow; achenes glabrous; leaflets toothed on the sides, thinner.
4. Leaflets densely white-tomentose beneath; cymes not very leafy, 1-few-flowered; plants of the Hudson Bay region.
5. Petioles floccose with curly hairs, lacking straight hairs..........16. *P. nivea*
5. Petioles pilose with long more or less straight hairs only..........16a. *P. nivea* ssp. *chamissonis*
4. Leaflets not white-tomentose; cymes very leafy, many-flowered.
6. Petals about half as long as the calyx-lobes; stamens 10-15; achenes smooth, 0·5-0·8 mm. long; leaflets oblong-cuneate; plant minutely pilose..........9. *P. millegrana*
6. Petals about equalling the calyx-lobes; stamens 15-20; achenes longitudinally ribbed, 0·8-1·3 mm. long; leaflets oblanceolate to obovate; plant more or less hirsute..........11. *P. norvegica*
2. Leaflets mostly 5-7.
7. Cymes very leafy.
8. Leaves green and glabrous above, densely white-tomentose beneath, with revolute margins; petals about equalling the calyx-lobes; stamens about 20..........12. *P. argentea*
8. Leaves pubescent on both sides, not white-tomentose beneath; petals scarcely half as long as the calyx-lobes; stamens 5..........10. *P. pentandra*
7. Cymes not very leafy.
9. Leaflets not tomentose beneath, sparingly hirsute....14b. *P. gracilis* var. *rigida*
9. Leaflets tomentose beneath.
10. Plant not much more than 1·5 dm. high; leaflets silky above, densely white-tomentose beneath..........15. *P. concinna*
10. Plants usually more than 2 dm. high.
11. Leaflets pectinately divided into narrowly linear lobes with revolute margins, densely white-tomentose beneath..........13. *P. flabelliformis*
11. Leaflets merely more or less deeply toothed.
12. Leaflets ashy-tomentose beneath; calyx silky-villous ..14. *P. gracilis*
12. Leaflets densely white-tomentose beneath; calyx white-villous..........14a. *P. gracilis* var. *pulcherrima*

1. Leaves pinnate.

13. Petals and inner side of sepals dark purple; style lateral; stems stout, ascending from a decumbent rooting woody base; aquatic or marsh plants.

14. Terminal leaflet one-half to two-thirds as broad as long; branches 1-4-flowered; plant of the Hudson Bay region................2a. *P. palustris* var. *parvifolia*

14. Terminal leaflet mostly narrower; flowers usually more numerous..........................................................................2. *P. palustris*

13. Petals yellow or whitish.

15. Plants glandular-villous, brownish-hairy; leaflets 7-11; cymes strict; style nearly basal; petals white or cream-colour.............................3. *P. arguta*

15. Plants not glandular-villous; petals yellow.

16. Shrubs, the pale outer bark shreddy; achenes pubescent......4. *P. fruticosa*

16. Herbs; achenes glabrous.

17. Flowers solitary on naked peduncles; style lateral, filiform, slender at base.

18. Leaflets glabrous or white-tomentose beneath with opaque hairs, the remainder of the plant essentially glabrous; bractlets entire; achenes not grooved; plant of the Hudson Bay region.........................................................6. *P. egedii* var. *groenlandica*

18. Leaflets silvery-silky beneath, the remainder of the plant more or less villous; bractlets usually toothed or divided; achenes with a deep dorsal groove....................................5. *P. anserina*

17. Flowers few to numerous; style terminal or nearly so, thickened at base.

19. Cymes very leafy, many-flowered.

20. Achenes longitudinally ribbed, with a thick corky protuberance on the inner side; lower leaves with 3-5 distant pairs of leaflets; petals about equalling the calyx-lobes..................7. *P. paradoxa*

20. Achenes smooth, without cork enlargement; lower leaves with 2 or 3 approximate pairs of leaflets; petals much smaller than the calyx-lobes.........................................8. *P. rivalis*

19. Cymes not very leafy, generally rather few-flowered.

21. Style much longer than the mature achene, filiform.

22. Pedicels in fruit arcuate-spreading; leaflets appressed-strigose or glabrate, deeply pinnatifid, the lobes usually linear...................................................19. *P. plattensis*

22. Pedicels not arcuate; leaflets tomentose beneath, silky or tomentose above.

23. Bractlets much shorter than the calyx-lobes; leaflets greyish-tomentose on both sides.....................17. *P. effusa*

23. Bractlets about equalling the calyx-lobes; leaflets with silvery-glistening hairs intermixed with the tomentum.......................................18. *P. hippiana*

21. Style not longer than the mature achene, thickened and glandular below (except in *P. multifida*).

24. Leaflets essentially glabrous...22b. *P. pensylvanica* var. *glabrata*

24. Leaflets tomentose beneath.

25. Style scarcely thickened at the non-glandular base; leaflets 5-7, greyish-tomentose beneath, smooth above, pectinately divided to near the midrib into linear acute revolute segments.............................21. *P. multifida*

25. Style thickened and glandular at base.

26. Basal leaves 5(-7)-foliolate; plants of the Hudson Bay region.

27. Leaves silky-pubescent on both sides with yellowish-tinged hairs; stems generally less than 1 dm. high, silky-hirsute with yellowish hairs....20. *P. pulchella*

27. Leaves greyish-tomentose and strongly veiny beneath, nearly glabrous above; stems usually 2-4 dm. high, slightly appressed silky-strigose...................................22c. *P. pensylvanica* var. *pectinata*

26. Basal leaves 7-15-foliolate.
    28. Leaves greyish-tomentose beneath, grey-green and often strigose above............22. *P. pensylvanica*
    28. Leaves whitish-tomentose beneath, silvery-silky above .............22a. *P. pensylvanica* var. *bipinnatifida*

1. **P. tridentata** Ait. (*Sibbaldiopsis tridentata* (Soland.) Rydb.) Three-toothed Cinquefoil

Sandy ground and rock outcrops throughout the province except the northeastern Barren Grounds and the southwestern prairie region. Northernmost collection: Cochrane River, lat. 58° 02′ N., sandy shore (Baldwin, 1951). Earliest collection seen: "between Norway House and York Factory" (McTavish, 1853-54). First report: Winnipeg and N.W. Angle Road [Dawson, 1875].

(Arctic-)subarctic American: n. Alta. to n. Lab. and Nfld., s. to Sask., N.D., Ia., Mich., and mts. of Ga.

2. **P. palustris** (L.) Scop. (*Comarum palustre* L.) Marsh Five-finger

Marshy ground and shallow water throughout the province except the extreme north. Northernmost collection seen: Knife Lake, about 120 miles southwest of Churchill (Gillett, 1948). Reported from Churchill by Størmer [1933] and Radforth [1950]. Earliest collection seen: Waterhen River at the northwest end of Lake Manitoba east of Duck Mountain, marshes and bogs . (Macoun, 1881). First report: "Lake Winipeg" [Bourgeau, in Palliser, 1863].

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to n. Que., n. Lab., and Nfld., s. to Calif., Wyo., and Pa.; s. Greenland; Iceland; Eurasia.

Forma *glandulosa* Gunnarsson (var. *villosa* (Pers.) Lehm.), with leaflets villous or densely silky, the upper part of the stem densely glandular as well as villous, is of local occurrence in the province. Specimens have been seen from "Lake Winipeg Valley" (Bourgeau, 1857) and Sandilands Forest Reserve (Breitung, 1949).

2a. **P. palustris** var. **parvifolia** (Raf.) Fern. & Long

Specimens have been seen from the following localities: Knee Lake, slough (Scoggan, 1949); York Factory, muskeg forest of black spruce and tamarack (Scoggan, 1949); Churchill River, long. 94° 50′ W. (Cairnes, 1915); Churchill (several collections, the first seen being one made by Macoun in 1910); Nejanilini Lake, lat. 59° 22′ N., marshy ground (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951); Baralzon Lake, lat 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: the present publication.

Northern part of the American (and perhaps circumpolar) area. Believed by Hultén [1946] to be merely an ecological form.

3. **P. arguta** Pursh (*Drymocallis agrimonioides* (Pursh) Rydb.) Tall Cinquefoil

Thickets, prairie, sandhills, rock outcrops, and clearings in the southern three-quarters of the province. Northernmost collection: Tod Lake, 56° 45′ N., 101° 47′ W. (Ritchie, 1955). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Red River [Dawson, 1875].

Subarctic American: south-central Alaska and n. Alta. to e. Que., s. to Colo., Okla., Mo., and W. Va.

4. **P. fruticosa** L. (*Dasiphora fruticosa* (L.) Rydb.; *Pentaphylloides fruticosa* (L.) Schwarz) Shrubby Cinquefoil

Prairie, shores, rock outcrops, and clearings in the southern three-quarters of the province. Northernmost collection seen: York Factory (McTavish, 1854; Scoggan, 1949, gravel beach of Hayes River). The citation from Churchill by Gardner [1937] remains to be verified. Earliest collection seen: the foregoing McTavish collection from York Factory. First report: Dawson [1875].

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to n. Man., s. Lab., and Nfld., s. to Calif., N.M., S.D., Ia., and Pa.; Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XXIX].

5. **P. anserina** L. (Incl. *P. pratincola* Boivin; *Argentina anserina* (L.) Rydb.) Silverweed

Moist, chiefly alkaline, prairie, shores, and clearings throughout the province, except the extreme north. Northernmost collection: York Factory (Scoggan, 1949). Earliest collection seen: Fort Garry (J. Schultz, 1860). First report: between York Factory and Churchill [Rae, 1850].

Subarctic circumpolar: Alaska (prob. introd.) to n. Man. and Nfld., s. to Calif., N.M., Ia., and N.E.; Iceland; Eurasia.

Forma *sericea* (Hayne) Hayek, with leaves silvery-silky above as well as beneath, is of fairly common occurrence with the main form.

6. **P. egedii** Wormskj. var. **groenlandica** (Tratt.) Polunin (Incl. *P. yukonensis* Hult. and *P. pacifica* Howell)

Specimens have been seen from the following localities: York Factory, clay flats of Marsh Point (Scoggan, 1949); Knife Lake, about 120 miles southwest of Churchill (Gillett, 1951); Churchill (several collections, the first by McTavish in 1853). First report: Churchill [Radforth, 1950; as *P. yukonensis*]. Probable basis of the listing of *Argentina subarctica* Rydb. by Lowe [1943].

Arctic American: n. coast of Alaska and Mack., Victoria I., s. Baffin I., n. Lab., and Nfld., s. along the coast of Calif., James Bay, and L.I.; s. Greenland; e. Asia.

7. **P. paradoxa** Nutt.

Specimens have been seen from the following localities: Winnipeg, low ground (Groh, 1932); Victoria Beach, near the south end of Lake Winnipeg (Neatby & Peterson, 1929, sandy shore; Denike, 1942); south shore of Lake Manitoba (McMorine, 1891); Killarney, northeast of Turtle

Mountain, by the lake (Macoun, 1896); Brandon (Macoun, 1896, old field; Stevenson, undated, damp open soil); Playgreen Lake, north of Lake Winnipeg, sandy shore (Scoggan, 1948); The Pas (Jackson, undated; Krivda, 1950, 1953). First report: The Pas [Lowe, 1943]. Probable basis of the citation of *P. supina* L. from Muskeg Island, Lake Winnipeg, by Macoun [1886].

Temperate American: B.C. to Ont., s. to N.M., Kans., La., Mo., and Pa.

8. **P. rivalis** Nutt.

Specimens have been seen from the following localities: Melita, about 60 miles southwest of Brandon, dry alkaline prairie (Scoggan, 1951); Forrest, north of Brandon, prairie (Macoun & Herriot, 1906); The Pas, wet ground (Krivda, 1949). First report (with citation of localities): the present publication; but Manitoba is included in the range given by Fernald [1950].

Temperate western American: B.C. to Man., s. to Calif., Mex., Kans. and Mo.

9. **P. millegrana** Engelm.

Specimens have been seen from the following localities: Brandon, along railway (Macoun, 1896); Grand Rapids, near the northwest end of Lake Winnipeg (Jackson, 1925). First report: Burman [1910].

Temperate western American: Alta. to Man., s. to Calif., N.M., Kans., Mo., and Ill.

10. **P. pentandra** Engelm.

Specimens have been seen from the following localities: East Selkirk, about 15 miles northeast of Winnipeg, thicket (Scoggan, 1951); banks of the Assiniboine River (McMorine, 1896); Turtle Mountain (no data); Brandon, ditches (Macoun, 1896). First report: "Manitoba" [Rydberg, Monograph of the North American Potentilleae, p. 48, 1898, citing Macoun, No. 12580, the foregoing Brandon collection].

Temperate western American: Alta. to Man., s. to Kans. and Ark.

11. **P. norvegica** L. (Incl. var. *hirsuta* (Michx.) Lehm.; *P. monspeliensis* L.)

Thickets, prairie, rock outcrops, shores, and clearings throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Fort Garry [Schultz, 1861]. Probable basis of the citation of *P. diversifolia* Lehm. from York Factory and Echimamish River to Oxford House by Bell [1881], taken up by Macoun [1883] under the name *P. dissecta* Pursh.

Subarctic circumpolar: n. Alaska to Great Bear L., s. Keewatin, n. Que., s. Lab., and Nfld., s. to Ariz., Tex., and N.C.; w. Greenland (introd.); Eurasia.

12. P. ARGENTEA L. Silvery Cinquefoil

Specimens have been seen from the following localities: Stockton, about 30 miles southeast of Brandon, railway clearing (Scoggan, 1953); Cowan, off the northeast edge of Duck Mountain, sandy jack-pine woods (Scoggan, 1953); Warren Landing, near the north end of Lake Winnipeg, sandy beach and fields (Scoggan, 1948). First report: Burman [1910].

Eurasian: widely naturalized in temperate North America.

13. **P. flabelliformis** Lehm.

The following is the only collection seen: Napinka, about 55 miles southwest of Brandon, hummocky meadow (Scoggan, 1953). First report: Nelson River [Bell, 1880]. This northern citation remains to be verified.

Temperate western American: B.C. to s. Man., s. to n. Calif. and Wyo.; s. Alaska (prob. introd.).

14. **P. gracilis** Dougl. (*P. camporum* Rydb.; *P. viridescens* Rydb.)

Prairie and sandhills of southern Manitoba. Northernmost collection: Birtle, about 60 miles northwest of Brandon (Macoun & Herriot, 1906). Earliest collection seen: Badger Creek, Man., open prairie (Burgess, 1873). First report: Pembina Mountain, south of Portage la Prairie [Dawson, 1875].

Subarctic western American: north-central Alaska to n. Alta. and Man., s. to Oreg. and Colo.; introd. further eastward.

14a. **P. gracilis** var. **pulcherrima** (Lehm.) Fern. (*P. pulcherrima* Lehm.)

Prairie, meadows, and clearings in the southern two-fifths of the province. Northernmost collection: The Pas, pasture (Krivda, 1951). Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: near Aweme, southeast of Brandon [Criddle, 1927]. Probable basis of the citation of *P. hippiana* var. *pulcherrima* Wats. (*P. filipes* Rydb.) from Wilkins Point, Lake Winnipegosis, by Macoun [1883], and of the listing of *P. filipes* by Lowe [1943].

Temperate western American: Alta. to south-central Man., s. to Utah, N.M., and S.D.; introduced eastward to N.H.

14b. **P. gracilis** var. **rigida** (Nutt.) Wats. (*P. nuttallii* Lehm.)

Specimens have been seen from the following localities: Brandon (Malte, 1918); Oak Lake, about 30 miles west of Brandon, prairie slope above Assiniboine River (Scoggan, 1953); The Pas, pasture (Krivda, 1951). First report (with citation of localities): the present publication; but Manitoba is included in the range given by Fernald [1950].

Temperate western American: B.C. to south-central Man., s. to Calif., Utah, Colo., S.D., and Minn.

15. **P. concinna** Richardson (Incl. *P. divisa* Rydb.)

Sandy prairie and gravelly clearings of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy prairie clearing (Scoggan, 1953). Earliest collection seen: Lake Manitoba (Schultz, 1861). First report: "Manitoba" [Rydberg, Monograph of the North American Potentilleae, p. 53, 1898, citing Macoun, No. 12623, from Brandon; as *P. concinna* var. *divisa* Rydb.].

Temperate western American: Alta. to s. Man., s. to Ida., Colo., and S.D.

16. **P. nivea** L.

Known in the province only from Churchill, the earliest collection seen from the locality being one made by Bell in 1879. First report: between York Factory and Churchill [Rae, 1850]. Probable basis of the citation of var. *subquinata* Lange from Churchill by Radforth [1950].

Arctic circumpolar: n. Alaska and coast of Yukon and Mack. to south-central Baffin I., n. Que., n. Lab., and Nfld., s. to James Bay and e. Que., and the mts. of Colo.; Greenland; n. Eurasia. A map of the greater part of the American distribution of the collective species, on which the dot indicating a station near the south end of Lake Winnipeg should be deleted, is given by Raup [1947, pl. XXVIII]. A map of the circumpolar distribution is given by Hultén [Botaniska Notiser, fig. 6, p. 143, 1945].

16a. **P. nivea** subsp. **chamissonis** (Hult.) Hiitonen (*P. chamissonis* Hult.)

Known in the province only from Churchill, the two collections seen having been made by McTavish in 1853 and Macoun in 1910. First report: the present publication.

Arctic amphi-Atlantic: coast of nw. Mack., Banks I., Victoria I., central Keewatin, central Baffin I., and n. Que., s. to Great Slave L., n. Man., and central Que.; Greenland; Spitsbergen; n. Scandinavia. A map of the distribution is given by Hultén [Botaniska Notiser, fig. 7, p. 144, 1945].

*P. nivea* var. *macrophylla* Ser. is reported from Manitoba by Rydberg [Monograph of the North American Potentilleae, p. 86, 1898], separated from the typical form chiefly on the basis of larger size. Its area is given as "Arctic and sub-arctic regions", although the single specimen seen by Rydberg was collected in 1881 by John Macoun, who, during that year, did not pass north of Red Deer Lake, about lat. 53° N. The specimen has not been seen by the present writer, but it is highly improbable that any member of the *P. nivea* complex occurs so far south in the province.

17. **P. effusa** Dougl.

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, grassy clearing on limestone substratum (Scoggan, 1951). Earliest collection seen: near Fort Ellice, about 65 miles northwest of Brandon, "throughout prairie region" (Macoun, 1872). First report: Pembina Mountain and "first crossing Souris River" [Dawson, 1875].

Temperate western American: Alta. to Man., s. to N.M., Neb., and w. Minn.

18. **P. hippiana** Lehm. (Incl. *P. argyrea* Rydb.)

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Birtle, about 65 miles northwest of Brandon (Dudley, 1941; Scoggan, 1953). Earliest collection seen: Birds Hill, near Winnipeg, gravel pit (Neatby & Peterson, 1929). First report: Red River [Hooker, 1834].

(Subarctic-)temperate western American: Alta. to s. Man., s. to Ariz., N.M., and Neb.; reported from south-central Alaska by Hultén [1946]. "Casual in grassland eastw." according to Fernald [1950].

19. **P. plattensis** Nutt.

Specimens have been seen from the following localities: Napinka, about 55 miles southwest of Brandon, hummocky pasture (Scoggan, 1953); Forrest, about 8 miles north of Brandon (Macoun & Herriot, 1906); Oak River, about 15 miles northwest of Brandon, prairie (Macoun & Herriot, 1906). First report: the present publication.

Temperate western American: Sask. to sw. Man., s. to Utah, N.M., and S.D.

20. **P. pulchella** R. Br.

Known in the province only from Churchill, the earliest collection seen having been made by Bell in 1879 at a short distance up Churchill River. First report: between York Factory and Churchill [Rae, 1850].

Arctic amphi-Atlantic: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to northernmost Ellesmereland), n. Que., and Akpatok I., Ungava Bay, s. along the coast of Hudson Bay to s. James Bay; Greenland; Spitsbergen; n. Europe; ne. Asia (Wrangel I.)

21. **P. multifida** L.

Specimens have been seen from the following localities: Gypsumville, about 125 miles north of Portage la Prairie, weathered gypsum at quarry (Scoggan, 1951); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, rocky shore (Scoggan, 1949); Norway House, off the northeast end of Lake Winnipeg, granite shore (Scoggan, 1948); Pipestone Lake, northeast of Lake Winnipeg, rocky shore (Scoggan, 1948); York Factory, dry soil (Bell, 1880; determined by Rydberg); Churchill (several collections, the first by Bell in 1879, at a short distance up Churchill River). First report: York Factory [Rydberg, Monograph of the American Potentilleae, p. 94, 1898].

Subarctic circumpolar: n. Alaska to ne. Alta., n. Man., and n. Que., s. to south-central Man., L. Superior, and James Bay; Spitsbergen; n. Eurasia.

22. **P. pensylvanica** L. (var. *strigosa* Pursh; var. *arida* Boivin; *P. lasiodonta* Rydb.)

Prairie, rock outcrops, and clearings in the southern three-quarters of the province. Northernmost collection: Tod Lake, 56° 45′ N., 101° 47′ W. (Ritchie, 1955). Reports of the species from Churchill by Bell [1884], Størmer [1933], and Radforth [1950] are probably referable to var. *pectinata*. Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: Turtle Mountain, open prairie [Dawson, 1875].

Subarctic American: north-central Alaska and nw. Mack. to central Man., s. to Calif., N.M., Neb., and n. Mich.

22a. **P. pensylvanica** var. **bipinnatifida** (Dougl.) T. & G. (*P. bipinnatifida* Dougl.)

Prairie and clearings of southern Manitoba. Northernmost collection: Oak Point, about 55 miles northwest of Winnipeg, grassy prairie (Scoggan, 1951). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Red River [Hooker, 1834].

Subarctic American: Alta. to w. Ung., s. to Colo., N.D., and Minn.

22b. **P. pensylvanica** var. **glabrata** (Hooker) Wats. (*P. glabrella* Rydb.)

Specimens have been seen from the following localities: Steeprock, about 100 miles north of Portage la Prairie, limestone strata (Scoggan, 1951); Norway House, off the northeast end of Lake Winnipeg, clearing (Scoggan, 1948); Playgreen Lake, north of Norway House, granite headland (Scoggan, 1948); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, rocky shore (Scoggan, 1949); Churchill, gravel (Gillett, 1948). First report: Lowe [1943].

Temperate American: Alta. to n. shore of L. Superior, s. to Wyo., S.D., and Ia.

22c. **P. pensylvanica** var. **pectinata** (Raf.) Lepage (*P. litoralis* Rydb.)

Known in Manitoba from only the following localities: York Factory, open ground (Scoggan, 1949); The Pas (Krivda, 1954); Churchill (several collections, the first by Bell in 1884). First report: "Manitoba (Hudson Bay coast)" [Boivin, Phytologia 4: 93. 1952]. Probable basis of the citation of *P. pensylvanica* var. *platyloba* Rydb. from York Factory by Rydberg [Monograph of the North American Potentilleae, p. 100, 1898].

(Subarctic-)temperate eastern American: ne. Man. to James Bay, s. Lab., and Nfld., s. along the coast to Me. and N.H.

*P. recta* L.: A specimen appearing referable here was collected in a gravel pit at Birds Hill, near Winnipeg, by D. Löve in 1954 (No. 6314). However, in view of the close similarity of this species to *P. gracilis* var. *rigida*, it is felt that further collections are necessary before admitting it to our flora.

### 9. RUBUS L.

### (Bramble)

1. Leaves simple, 1-3, suborbicular, firm, more or less 5-lobed; flowers white, solitary; plant extensively creeping, unarmed.......................................... 1. *R. chamaemorus*

1. Leaves 3-5-foliolate.
   2. Stems slightly woody, armed with prickles and bristles; flowers numerous, about

1 cm. broad.

3. Bark of primocanes glabrous or at most glaucous beneath the prickles, in age becoming lustrous. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .2. *R. idaeus* var. *strigosus*
3. Bark of primocanes ashy-tomentose beneath the prickles. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .2a. *R. idaeus* var. *canadensis*

2. Stems herbaceous, unarmed, 1-7-flowered.
    4. Stems erect or tufted, without runners; flowers usually solitary, roseate, 1·5-2 cm. long; leaflets obtuse or rounded at apex. . . . . . . . . . . . . . . . . . . . . . . . . . . .3. *R. acaulis*
    4. Stems with slender runners.
        5. Flowers white or pale pink, 1-7, their petals 6-10 mm. long; central leaflet tapering about equally to the acute apex and base; runners numerous and extensive, rooting at the tips. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4. *R. pubescens*
        5. Flowers roseate, usually 2 or 3, the petals mostly 1 cm. long or more; central leaflet short-acute at apex; runners less highly developed. . . . . . . .5. *R. paracaulis*

1. **R. chamaemorus** L. Baked-apple-berry

Peat bogs, muskeg forest, and tundra in the northern five-sixths of the province. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Southernmost collection seen: Duck Mountain, open woods (Scoggan & Baldwin, 1950). Reported also from Riding Mountain by Halliday [1932]. Earliest collection seen: York Factory (McTavish, 1854). First report: Lake Winnipeg [Hooker, 1834].

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to s. Baffin I., n. Que., n. Lab., and Nfld., s. to s. B.C., n. shore of L. Superior, and mts. of N.E.; sw. Greenland; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXVIII].

2. **R. idaeus** L. var. **strigosus** (Michx.) Maxim. (*R. strigosus* Michx.) Raspberry

Thickets, rock outcrops, and clearings in the southern three-quarters of the province. Northernmost collection: Knife Lake, about 120 miles south of Churchill (Gillett, 1948). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Turtle Mountain [Dawson, 1875, p. 289]. Basis of most reports of the main form from the province.

Subarctic American: central Alaska and nw. Mack. to n. Man., central Lab., and Nfld., s. to Wyo., Neb., Minn., and Va.

2a. **R. idaeus** var. **canadensis** Richards. (subsp. *sachalinensis* (Leveille) Focke)

Similar habitats throughout the province except the southern prairie region. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., gravel ridge (Baldwin, 1951). Earliest collection seen: Aweme, about 20 miles southeast of Brandon (Criddle, 1926). First report: Nueltin Lake and Cochrane River [Baldwin, 1953]. Probable basis of the report of var. *aculeatissimus* Regel & Tiling from Warren Landing by Lowe [1920] and from Aweme by Criddle [1927], which should be looked for in the province. The Aweme collection has not been seen.

Subarctic American: about the range of var. *strigosus*, although probably more northerly; e. Asia.

3. **R. acaulis** Michx. (*R. arcticus* L. var. *grandiflorus* Ledeb.)

Boggy ground, wet woods, muskeg forest, and tundra almost throughout the province. Northernmost collection: Churchill (several collections, the earliest seen being made by McTavish in 1853). Earliest collection seen: the foregoing McTavish specimen from Churchill. First report: between York Factory and Churchill [Rae, 1850]. Probable basis of the reports of *R. arcticus* L. from Lake Winnipeg by Bourgeau [in Palliser, 1863], from Churchill by Radforth [1950], and from Warren Landing by Lowe [1920].

(Arctic-)subarctic American: n. Alaska to south-central Keewatin, n. Lab., and Nfld., s. to s. B.C., Colo., Sask., n. Minn., and e. Que.

4. **R. pubescens** Raf. (*R. triflorus* Richards.)

Thickets, woods, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Manitoba House, Lake Manitoba (Macoun, 1881). First report: near York Factory [Hooker, 1834].

Subarctic American: central Yukon and sw. Mack. to n. Man., central Lab., and Nfld., s. to Colo., S.D., and Pa.

5. **R. paracaulis** Bailey, Gentes Herbarum 5: 33. 1941. (*R. arcticus* of Gray's Manual, ed. 8, in part, not L.) [*See* Hultén, 1946, p. 995; Porsild, 1951, p. 219].

Specimens, the majority determined by Porsild, have been seen from the following localities: "L. Winipeg Valley" (Bourgeau, 1859); Vivian, east of Winnipeg (Simpson, 1935); Doghead Point, Lake Winnipeg (Macoun, 1884); Cowan, off the northeast edge of Duck Mountain (Criddle, 1926); The Pas, in old sawdust of lumberyard (Krivda, 1954); Churchill (Macoun, 1910; Polunin, 1936); Nueltin Lake, lat. 59° 43′ N., wet black spruce woods (Baldwin, 1951). First report: Nueltin Lake [Baldwin, 1953]. Suggesting a hybrid between *R. acaulis* and *R. pubescens*.

(Subarctic-)temperate American: south-central Alta., n. Sask., and n. Man. to James Bay, north-central Que., and Nfld., s. to s. Alta. and e. Que.

*R. occidentalis* L. is reported from near Carberry by Shimek [1927, p. 29], but no specimens have been seen, and it is probable that the citation is referable to a variety of *R. idaeus*.

## 10. PRUNUS L.

## (Plum. Cherry)

[*See* Groh & Senn, 1940.]

1. Flowers numerous in elongate racemes; leaves ovate or obovate, thin, finely and sharply toothed............................................1. *P. virginiana*

1. Flowers in clusters of usually 2 or 5.

  2. Petals 9-15 mm. long; fruit with 2 opposite shallow furrows.

    3. Leaves sharply serrate, the teeth bristle-tipped; petioles mostly without terminal glands; calyx-lobes usually entire, densely pubescent within.......2. *P. americana*

3. Leaves with rounded gland-tipped teeth; petioles often with a pair of terminal glands at base of blade; calyx-lobes glandular-serrate, essentially glabrous within.. ........................................................ 3. *P. nigra*

2. Petals not more than 8 mm. long; fruit without longitudinal furrows.

4. Leaves green beneath, finely and sharply toothed to base; fruit 5-7 mm. in diameter, the subglobose stone 4-5 mm. long; coarse shrub or small tree.................... ........................................................ 4. *P. pensylvanica*

4. Leaves pale or glaucous beneath, subentire toward base; low shrubs............. ........................................................ 5. *P. pumila* var. *cuneata*

1. **P. virginiana** L. (*P. nana* Dur.) Choke-cherry

Dry prairie, sandhills, rock outcrops, and shores in the southern half of the province. Northernmost collection: (Waddy Lake, southwest of Churchill (W. H. Bryenton, 1948). Earliest collection seen: Portage la Prairie (Macoun, 1879). First report: Dufferin and First Crossing Souris River [Dawson, 1875].

(Subarctic-)temperate American: s. B.C. to north-central Man. and Nfld., s. to Tex. and Ga. A map of the area is given by Munns [1938] and one of the northern part of the distribution by the Dominion Forest Service [1949, p. 222].

*P. melanocarpa* (Nels.) Rydb. is reported from St. Lazare in the undated supplement to Lowe's 1943 checklist. No specimens have been seen, however, and, in view of its close similarity to the foregoing species, it should be excluded from our flora for the present.

2. **P. americana** Marsh. Wild Plum

Specimens have been seen from the following localities: Shoal Lake, east of Winnipeg near the Ontario boundary (Lowe, 1920); Winnipeg and vicinity (Lowe, 1908; unknown collector, 1945, woods; Halliday, 1932, garden); Otterburn, south of Winnipeg, thickets (Macoun, 1896); Dufferin, about 45 miles southwest of Winnipeg, thickets (Dawson, 1873-74); Morden, about 60 miles southwest of Winnipeg, thickets along river (Macoun, 1896; Scoggan, 1951). First report: Red River [Bourgeau, in Palliser, 1863].

Temperate American: Mont. to s. Man. and s. Que., s. to Ariz., Ark., and n. Fla. A map of the area is given by Munns [1938], and one of the northern part of the distribution by the Dominion Forest Service [1949].

3. **P. nigra** Ait. Canada Plum

Specimens have been seen from the following localities: "L. Winipeg Valley" (Bourgeau, 1857); Sundown, about 65 miles southeast of Winnipeg (Dudley, 1927); Sandilands Forest Reserve, southeast of Winnipeg, sandy jack-pine woods (Scoggan, 1951); Winnipeg and vicinity (Neatby, 1929, roadside; Marquardt, 1931; Halliday, 1933; Denike, 1939; McMillan, 1944; Scoggan, 1951, thicket). First report: Jackson *et al.* [1922].

Temperate eastern American: se. Man. to Que., s. to Ia., Va., and Ga. A map of the northern part of the distribution is given by the Dominion Forest Service [1949, p. 226].

4. **P. pensylvanica** L. f. Pin-Cherry. Fire-Cherry

Sandy ground, rock outcrops, and clearings throughout the province except the extreme north. Northernmost collection: Cochrane River, lat. 58° 13′ N., open black spruce woods (Baldwin, 1951). Earliest collection seen: between York Factory and Lake Winnipeg (McTavish, undated, but probably collected in 1853 or 1854; the earliest dated collection seen is one taken by Macoun along Red River in 1879). First report: foot of Pembina Mountain, south of Portage la Prairie [Dawson, 1875].

(Subarctic-)temperate American: s. Mack. to s. Lab. and Nfld., s. to Colo., S.D., Tenn., and N.C. A map of the area is given by Munns [1938], and of the northern part of the distribution by the Dominion Forest Service [1949].

5. **P. pumila** L. (Incl. var. *cuneata* (Raf.) Bailey, var. *susquehanae* (Willd.) Jaeger, and var. *besseyi* (Bailey) Gleason) Sand-Cherry

Dry prairie, sandhills, and rock outcrops in the southern third of the province. Northernmost collection: Grand Rapids, off the northwest end of Lake Winnipeg, limestone-gravel ridge and cobble beach (Scoggan, 1948). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1859). First report: "Winipeg" [Bourgeau, in Palliser, 1863; *Cerasus pumila*].

Temperate American: e. Sask. to Que., s. to Wyo., Colo., and Va.

### 11. CRATAEGUS L.

(Hawthorn)

1. Stamens about 20; nutlets 3-5, plane on the inner surface; fruits 1·2-2 cm. thick; leaves mostly obovate, usually slightly lobed toward the apex................1. *C. punctata*
1. Stamens about 10; fruits usually 1 cm. or less thick; leaves elliptic, rhombic, or suborbicular, usually distinctly lobed toward the apex.
    2. Nutlets 3-4, plane on the inner surface..........................2. *C. chrysocarpa*
    2. Nutlets 2-3, pitted on the inner surface.............3. *C. succulenta* var. *occidentalis*

1. **C. punctata** Jacq.

Known in the province only from "Point du Chien" (probably Doghead Point, Lake Winnipeg), where it was collected by Macoun in 1872. First report: the present publication. Probable basis of the citation of *C. tomentosa* L. from Lake Winnipeg by Bourgeau [in Palliser, 1863].

Temperate eastern American: Man. to Que., s. to Ia. and Ky.

2. **C. chrysocarpa** Ashe

Thickets and clearings in the southern third of the province. Northernmost collection: Grand Rapids, off the northwest end of Lake Winnipeg, river-bank near dwelling (Scoggan, 1948). First report: Lowe [1943].

(Subarctic-)temperate American: Man. to Nfld., s. to N.M. and N.E.

3. **C. succulenta** Link var. **occidentalis** (Britt.) Palmer

Thickets and clearings of southern Manitoba. Northernmost collection: Victoria Beach, near the south end of Lake Winnipeg, sandy soil at edge of woods (Breitung, 1949). Earliest collection seen: Portage la Prairie (Macoun & Herriot, 1906). First report: the present publication, with citation of specimens, although Manitoba is included in the ranges given by Fernald [1950] and Gleason [1952]. Basis of the listing of the main form by Lowe [1943], and probable basis of the citation of *C. coccinea* by Dawson [1875], Macoun [1883], and Burman [1910], and of *C. crus-galli* by Bell [1882].

Temperate American: Mont. to s. Man. and Mich., s. to Colo. and Neb.

*C. douglasii* Lindl. is reported from Red River, Emerson, and Winnipeg by Macoun [1886], but must be excluded from our flora until further study is made of this difficult genus in Manitoba.

### 12. AMELANCHIER Medic.

### (Juneberry. Serviceberry. Shadbush)

[*See* Wiegand, 1912; Nielsen, 1939; Jones, 1946.]

1. Leaves broadly rounded to truncate at apex, yellowish-tomentose beneath when young; petals 6-7·5 mm. long........................................1. *A. alnifolia*
1. Leaves broadly subacute to rounded at apex, whitish-tomentose beneath when young; petals 7-10 mm. long........................................2. *A. humilis*

1. **A. alnifolia** Nutt. (*A. florida* of auth., not Lindl.)

Thickets, rock outcrops, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Burman [1910]. Probable basis of the citation of *A. canadensis* from the province by Dawson [1875] and Lowe [1943], of *A. canadensis* var. *oblongifolia* by Bell [1880, 1881] and Macoun [1883], and of *A. canadensis* var. *botryapium* by Bell [1881].

Subarctic western American: central Alaska to Great Bear L. and n. Man., s. to Oreg., Colo., Neb., and Ia. A map of the greater part of the distribution is given by Jones [1946, p. 69. map 9].

2. **A. humilis** Wieg. (*A. spicata* of auth., not K. Koch)

Specimens have been seen from the following localities: Indian Bay, east of Winnipeg (Scott, 1925); Winnipeg (Macoun, 1896; Higham, 1922); Macgregor, about 50 miles east of Brandon (Macoun & Herriot, 1906); Dickson's Landing, Lake Winnipegosis, open woods (Macoun, 1881); Bear Lake, northwest of Oxford Lake (Moore, 1953). First report: the present publication; basis of reports of *A. spicata* from the province by Criddle [1927] and Bird [1927], and probable basis of the inclusion of Manitoba in the range of *A. mucronata* Nielsen by Fernald [1950].

Temperate eastern American: Man. to Que., s. to S.D. and Pa.

*A. sanguinea* (Pursh) DC. is cited from Aweme, southeast of Brandon, by Lowe [1943], and is indicated by Jones [1946, map 8, p. 61] as approaching the southeastern corner of the province. Further study of this difficult genus is necessary, however, before this species can be admitted to our flora.

### 13. SORBUS L.

### (Mountain-Ash)

[*See* Jones, 1939.]

1. Leaflets short-acuminate to obtuse, mostly not more than 3 times as long as wide; stamens about equalling the petals; fruit 8-10 mm. in diameter............1. *S. decora*
1. Leaflets long-acuminate, 3-5 times as long as wide; stamens shorter than the petals; fruit 5-6 mm. in diameter..........................................2. *S. americana*

1. **S. decora** (Sarg.) Schn. (*S. americana* Pursh, not Marsh.; *Pyrus decora* (Sarg.) Hyland)

Woods, rock outcrops, and shores in the southern half of the province. Northernmost collection: Bear Lake, northwest of Oxford Lake (Moore, 1953). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1859). First report: Norway House and Cross Lake [Scoggan, 1950]. Basis of the citation of *Pyrus americana* from central Manitoba by Bell [1882] and from "Lake Winnipegoosis" by Macoun [1883], and of *Sorbus scopulina* from Riding Mountain and Swan River by Lowe [1943]. Probable basis of the citation of *Pyrus "aucuparida"* from "Winipeg River" by Bourgeau [in Palliser, 1863] and of P. *sambucifolia* from Winnipeg River and the north end of Lake Winnipeg by Macoun [1883].

Subarctic eastern American (incl. var. *groenlandica* (Schneid.) Jones): central Man. to central Lab. and Nfld., s. to Minn. and N.E.; s. Greenland. A map of the greater part of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by the Dominion Forest Service [1949, p. 208].

2. **S. americana** Marsh. (*Pyrus microcarpa* (Pursh) DC.; *P. americana* of Gray's Man., ed. 8, not (Pursh) DC.) [*See* Jones, Rhodora 55: 358-360. 1953].

A single specimen has been seen from Winnipeg, where it was collected by V. W. Jackson (sheet undated). First report: "Victoria Beach to Ontario" [Lowe, 1943]. As indicated above, most earlier citations of *S. americana* from the province are referable to *S. decora*.

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to n. Ill. and Md., upland to Tenn. and Ga. A map of the greater part of the distribution is given by the Dominion Forest Service [1949, p. 210].

### ***Physocarpus*** Maxim.

*P. opulifolius* (L.) Maxim., Ninebark: Manitoba is included in the range assigned this species by Billington ["Shrubs of Michigan", Cranbrook Institute of Science, Bull. 20, p. 93], but no specimens have been seen, and it must be excluded from our flora for the present.

## 57. LEGUMINOSAE

### (Pulse Family)

[*See* Fassett, 1939.]

1. Terminal leaflet of the pinnate leaves modified into tendrils, the plants low-climbing.
   2. Wings of the flower coherent with the keel; styles filiform, with a tuft of hairs at the summit.................................................14. *Vicia*
   2. Wings essentially free; styles flattened, bearded down the inner face.......15. *Lathyrus*

1. Terminal leaflet normal, the plants not climbing.

3. Leaves palmately 3(-5)-foliolate; stamens 10.

4. Stamens distinct to the base; flowers yellow, in terminal or lateral racemes; pods 5-6 cm. long, stalked in the calyx-tube, greyish-strigose; leaflets sessile, entire; plant appressed silky-pubescent.................................1. *Thermopsis*

4. Stamens usually diadelphous (9 of their filaments united into a columar tube, the remaining one nearly free).

5. Leaflets toothed, at least minutely so.

6. Pods straight or nearly so.

7. Flowers in a loose or dense head, their more or less persistent petals adhering to the stamen-tube.......................................2. *Trifolium*

7. Flowers in slender spike-like racemes, their deciduous petals free from the stamen-tube.......................................3. *Melilotus*

6. Pods curved or spirally coiled; flowers in spike-like racemes, their petals free from the stamen-tube.......................................4. *Medicago*

5. Leaflets entire.

8. Stems twining, climbing on vegetation, they and the petioles villous with long, mostly reflexed, brownish hairs; upper petaliferous flowers producing several-seeded pods, the lower apetalous flowers producing fleshy, mainly 1-seeded, often subterranean fruits...............................16. *Amphicarpa*

8. Stems not twining; flowers all alike.

9. Pods pubescent, jointed, the usually 3-5 joints 1-seeded and separating at maturity; flowers up to 1·5 cm. long, numerous in terminal or axillary racemes, rose-purple (or blue on drying); leaflets 3.........13. *Desmodium*

9. Pods continuous, not jointed.

10. Flowers mostly solitary in the leaf-axils, roseate, about 4 mm. long; pods glabrous, dehiscent, up to 3 cm. long; leaflets mostly 3, rarely 4 or 5, or the upper leaves 1-foliolate.........................5. *Lotus*

10. Flowers in clusters of 2-4, or in many-flowered spikes, bluish, longer; pods glabrous or silky, indehiscent, short; leaflets 3-5.........6. *Psoralea*

3. Leaves pinnately 5-many-foliolate (or sometimes 3-foliolate in No. 8, with 5 monadelphous stamens).

11. Stamens 5, monadelphous (all 5 filaments united into a column); flowers small, in dense terminal spikes; pod included in the calyx, 1-2-seeded, indehiscent...............................................................8. *Petalostemum*

11. Stamens 10.

12. Stamens monadelphous at the very base, their filaments free for most of their length, they and the style enveloped by the corolla consisting of only 1 petal (the standard), the other petals wanting; shrubs with violet or purple flowers crowded in terminal spike-like racemes........................7. *Amorpha*

12. Stamens diadelphous (9 of their filaments united into a tube, the remaining one nearly free).

13. Pods jointed, the several roundish, 1-seeded, indehiscent joints readily disarticulating; flowers pink or deep purple, racemose........12. *Hedysarum*

13. Pods continuous.

14. Pods oblong, 5-15 mm. long, densely covered with hooked prickles (suggesting the burs of Cocklebur); flowers whitish, in axillary, long-peduncled spikes; leaflets 15-19, oblong-lanceolate......11. *Glycyrrhiza*

14. Pods not prickly.

15. Standard (upper or odd petal) suborbicular.............*Tephrosia*

15. Standard relatively narrow.

16. Flowering stems leafless; keel-petal tipped by a sharp point..........................................................9. *Oxytropis*

16. Flowering stems mostly leafy; keel-petal rounded (rarely subacute) at apex.............................10. *Astragalus*

### 1. THERMOPSIS R. Br.

1. **T. rhombifolia** (Nutt.) Richards. Golden Pea

Dry prairie of southwestern Manitoba, but collected, presumably as a waif, at Churchill (Beckett, 1946; "one clump only on river bank on site of old building"). Specimens have been seen from the following southern localities: "First crossing Souris River", west of Turtle Mountain, gravelly hillsides (Burgess, 1874); Shilo, about 12 miles east of Brandon (unknown collector, 1949); Aweme, about 20 miles southeast of Brandon (Simpson, 1938); Lyleton, about 80 miles southwest of Brandon (Dudley, 1936); Melita, about 60 miles southwest of Brandon (Lowe, 1935); Tilston, about 70 miles southwest of Brandon, dry prairie (Scoggan, 1953); Elkhorn, about 60 miles west of Brandon (Archer, 1909). First report: "First crossing Souris River and westward" [Dawson, 1875].

Temperate western American: Sask. and Man., s. to Colo. and Neb.

### 2. TRIFOLIUM L.

### (Clover)

1. Flowers sessile in a dense head 1·2-3 cm. long, roseate, only the lower ones reflexed in age ........ 1. *T. pratense*
1. Flowers pedicelled in loosening heads, their pedicels reflexed in age.
    2. Flowers yellow, the heads 8-12 mm. thick; leaflets cuneate-obovate, the lateral ones nearly sessile........ *T. procumbens*
    2. Flowers white, pink, or roseate.
        3. Stems widely creeping, the ascending peduncles scape-like; corolla white or rose-tinged; calyx-teeth shorter than the tube; leaflets notched at apex....... 2. *T. repens*
        3. Stems arched-ascending to erect; corolla pink and white, or roseate throughout; calyx-teeth about equalling the tube; leaflets oval to cuneate-obovate........ 3. *T. hybridum*

1. T. PRATENSE L. (Incl. var. *sativum* (Mill.) Schreb.) Red Clover

Fields and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Brandon, ditches (Macoun 1896). First report: Burman [1910].

European: widely naturalized in North America and often escaped from cultivation.

*T. procumbens* L., Low Hop-Clover: the citation from Margaret, about 30 miles south of Brandon, by Lowe [1943] is referable to *Medicago lupulina.*

2. T. REPENS L. White Clover

Fields and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: Brandon, railroad ditch (Macoun, 1896). First report: Burman [1910].

European: widely naturalized in North America.

3. T. HYBRIDUM L. Alsike Clover

Fields and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Brandon, wet and waste places (Macoun, 1896). First report: Jackson *et al.* [1922].

European: widely naturalized in North America.

### 3. MELILOTUS Mill.

(Sweet Clover)

1. Flowers yellow, 5-6 mm. long; pods 2·5-3·5 mm. long, strongly reticulate.................................................................1. *M. officinalis*
1. Flowers white, 3-5 mm. long; pods 3-4 mm. long, weakly reticulate.................................................................2. *M. alba*

1. M. OFFICINALIS (L.) Lam. Yellow Melilot

Fields and clearings in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). Earliest collection seen: Brandon, vacant lot (Macoun, 1896). First report: Burman [1910].

European: widely naturalized in North America.

2. M. ALBA Desr. White Melilot

Fields and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railroad bank (Schofield, 1950). Earliest collection seen: Brandon, streets (Macoun, 1896). First report: Burman [1910].

European: widely naturalized in North America.

### 4. MEDICAGO L.

(Medick)

1. Flowers yellow, 3-4 mm. long; pods coiled, slightly spiral only at tip; plants prostrate.
   2. Peduncles and pods pilose or glabrate..............................1. *M. lupulina*
   2. Peduncles and pods with stalked glands..............1a. *M. lupulina* var. *glandulosa*
1. Flowers 6-12 mm. long; stems ascending.
   3. Flowers blue-violet to purple, 7-12 mm. long; pods making 2 or 3 spirals....2. *M. sativa*
   3. Flowers yellow, 6-8 mm. long; pods merely curved....................3. *M. falcata*

1. M. LUPULINA L. Black Medick

Fields and clearings in the southern part of the province. Northernmost collection: Duck Mountain, roadside clearing (Scoggan & Baldwin, 1950). Earliest collection seen: Killarney, northeast of Turtle Mountain, by an elevator (Macoun, 1896). First report: Burman [1910].

European: widely naturalized in North America.

1a. M. LUPULINA var. GLANDULOSA Neilr.

Fields and clearings in the southern two-fifths of the province. Northernmost collection: The Pas, in old sawdust of mill grounds, introduced locally (Krivda, 1954). Earliest collection seen: Winnipeg (Mawson, 1918). First report: the present publication.

European: naturalized in North America almost throughout the area of the main form.

2. M. SATIVA L. Alfalfa. Lucerne

Fields and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Headingly, near Winnipeg (Simpson, 1934). First report: Burman [1910].

Eurasian: widely naturalized in North America, and often escaped from cultivation.

Forma *alba* Benke, with white corolla, has been collected by the writer at Morden, Forrest, and Erikson.

3. M. FALCATA L.

Two specimens have been seen from the vicinity of Benito, near the northwest edge of Duck Mountain: (Taylor, 1929; Matthews, undated). First report: Jackson *et al.* [1922].

European: naturalized in temperate eastern North America.

### 5. LOTUS L.

1. **L. americana** (Nutt.) Bisch. (*Hosackia americana* (Nutt.) Piper; *H. purshiana* Benth.; *Acmispon americanus* (Nutt.) Rydb.) Prairie-Trefoil

Specimens have been seen from the following localities: Domain, about 22 miles south of Winnipeg, roadside (Dore, 1948); Morden, about 60 miles southwest of Winnipeg (Groh, 1921); Fortier, near the south end of Lake Manitoba, roadside ditch (A. & D. Löve, 1952); Stockton, about 25 miles southeast of Brandon (Criddle, 1928); Souris Co., prairie (Walker, 1889); Griswold, about 25 miles west of Brandon (Burman, 1887); Oak Lake, about 30 miles west of Brandon, prairie slope above Assiniboine River (Scoggan, 1953); Virden, about 45 miles west of Brandon, gravel bank of creek (Burman, 1887). First report: Burman [1910].

Temperate western American: sw. B.C. to s. Man., s. to Calif., Tex., and Ark.; introd. further eastward.

### 6. PSORALEA L.

(Scurf-pea)

1. Plant densely appressed silvery-silky throughout, up to 6 dm. high, from a creeping rhizome; leaflets 3-5; flowers in clusters of 2-4........................1. *P. argophylla*

1. Plant long-hirsute throughout, up to 4 dm. high, from a large, parsnip-shaped, erect taproot; leaflets 5; flowers numerous in dense spikes..................2. *P. esculenta*

1. **P. argophylla** Pursh (*Psoralidium argophyllum* (Pursh) Rydb.)

Dry prairie of southern Manitoba. Northernmost collection: Dropmore, southwest of Duck Mountain, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Fort Garry [Schultz, 1861].

Temperate western American: Sask. and Man., s. to N.M., Okla., and Mo. A map of the distribution is given by Fassett [1939, p. 42].

2. **P. esculenta** Pursh (*P. brachiata Dougl.*; *Pediomelum esculentum* (Pursh) Rydb.) Breadroot

Dry prairie of southern Manitoba. Northernmost collection: Millwood, about 85 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Fort Garry [Schultz, 1861].

Temperate western American: Alta. to Man., s. to N.M., Tex., and Mo. A map of the distribution is given by Fassett [1939, p. 42].

### 7. AMORPHA L.

1. Leaflets 5-10 mm. long, conspicuously glandular-punctate beneath; leaves subsessile; racemes solitary at the tips of the branches; plant essentially glabrous.......1. *A. nana*
1. Leaflets not glandular-punctate; racemes paniculate-clustered.
    2. Plant densely white-villous, rarely 1 m. high; leaves and leaflets subsessile, the latter 8-15 mm. long..............................................2. *A. canescens*
    2. Plant sparsely pubescent to glabrate, up to 4 m. high; leaves long-petioled; leaflets distinctly petiolulate, 2-4 cm. long..................3. *A. fruticosa* var. *angustifolia*

1. **A. nana** Nutt. (*A. microphylla* Pursh) Fragrant False Indigo

Dry prairie of southern Manitoba. Northernmost collection: Oak Point, about 50 miles northwest of Winnipeg, grassy slope (Macoun, 1872). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Red River [Bourgeau, in Palliser, 1863].

Temperate western American: Sask. and Man., s. to Kans. and Ia.

2. **A. canescens** Pursh Leadplant

Dry prairie of southern Manitoba. Northernmost collection: Brokenhead, about 30 miles northeast of Winnipeg (A. & D. Löve, 1952). Earliest collection seen: Portage la Prairie (Macoun, 1872). First report: Red River [Hooker, 1830].

Temperate western American: Sask. to Man. and Mich., s. to N.M., Tex., Ark., and Ind. A map of the distribution is given by Fassett [1939, p. 49].

3. **A. fruticosa** L. var. **angustifolia** Pursh (*A. fragrans* Sweet) False Indigo

Thickets and shores of southern Manitoba. Northernmost collection: East Selkirk, about 20 miles northeast of Winnipeg, border of elm woods (Scoggan, 1951). Earliest collection seen: Morris, about 35 miles south of

Winnipeg, thickets by Red River (Macoun, 1896). First report: Fassett [1939; map, p. 49, showing station in southeastern Manitoba]. Basis of earlier reports of the main form from the province.

Temperate western American: se. Man. to Wisc., s. to Ariz., Tex., and n. Mex. A map of the distribution is given by Fassett [1939, p. 49].

### 8. PETALOSTEMUM Michx.

### (Prairie-Clover)

1. Flowers white; calyx and bracts glabrous or nearly so.
  2. Spikes dense; bracts longer than the calyx-lobes....................1. *P. candidum*
  2. Spikes loose in maturity; bracts barely exceeding the calyx-lobes.....2. *P. occidentale*
1. Flowers roseate to purplish; calyx and bracts densely hairy.
  3. Leaflets 3-7, linear; spikes dense, 1-5 cm. long; plant glabrous or sparingly hairy....................................................3. *P. purpureum*
  3. Leaflets 13-19, elliptic or oblong; spikes loosening, 3-12 cm. long; plant silky-hairy throughout..................................................4. *P. villosum*

1. **P. candidum** (Willd.) Michx. (*Dalea candida* Willd.) White Prairie-Clover

Dry prairie of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandhills (Scoggan, 1953). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Red River [Hooker, 1830].

Temperate (interior) American: Sask. and Man., s. to Tex., La., and Miss. A map of the distribution is given by Fassett [1939, p. 53].

2. **P. occidentale** (Gray) Fern. (*P. oligophyllum* (Torr.) Rydb.)

Specimens have been seen from the following localities: Lauder, about 45 miles southwest of Brandon, prairie (Scoggan, 1951); Aweme, about 20 miles southeast of Brandon (White, 1922); Brandon, dry gravelly knolls (Macoun, 1896); St. Lazare, about 75 miles northwest of Brandon (Scoggan, 1951). First report: Poplar Point, about 35 miles southeast of Brandon [Campbell collection cited in undated supplement to Lowe's 1943 check-list].

Temperate western American: Alta. to Man. and Minn., s. to Mex., Tex., and La.

3. **P. purpureum** (Vent.) Rydb. (*P. violaceum* Michx.; *Dalea purpurea* Vent.)

Dry prairie of southern Manitoba. Northernmost collection: Bield, south of Duck Mountain, isolated prairie hills (Scoggan, 1951). Earliest collection seen: Fort Garry and Assiniboine River (Schultz, 1861). First report: Turtle Mountain and "Rising ground E. of Red River prairie" [Dawson, 1875].

Temperate western American: Mont. to Sask. and Man., s. to N.M., Tex., Ark., and w. Tenn.; introd. farther eastward. A map of the distribution is given by Fassett [1939, p. 58].

4. **P. villosum** Nutt. (*Dalea villosa* Spreng.)

Dry prairie of southern Manitoba. Northernmost collection: Shilo, about 15 miles east of Brandon, sandhills (Given, 1943). Earliest collection seen: Aweme, about 20 miles southeast of Brandon (Criddle, 1904). First report: sandhills of the Souris River [Bourgeau, in Palliser, 1863].

Temperate (interior) American: Sask. to Man. and Mich., s. to N.M. and Tex. A map of the distribution is given by Fassett [1939, p. 53].

## 9. OXYTROPIS DC.

[*See* Barneby, 1952.]

1. Leaflets in pairs (rarely some of the nodes with more than 2 leaflets).
  2. Flowers and pods reflexed; corolla whitish, lilac, or bluish; stipules nearly free from the petioles .......... 2. *O. deflexa* var. *sericea*
  2. Flowers and pods erect or spreading; stipules strongly adnate to the petioles.
    3. Corolla whitish, cream-colour, or pale yellow; pubescence of basifixed hairs.
      4. Leaflets 11-15(-17); corolla 18-23 mm. long; plant of dry prairie slopes and sandhills .......... 3. *O. sericea* var. *spicata*
      4. Leaflets usually more numerous; corolla mostly 12-17 mm. long.
        5. Stipules devoid of clavate processes; leaflets opposite; calyx 7-9·5 mm. long, the hairs mostly pale; plant chiefly of prairie habitats .......... 4. *O. campestris* var. *gracilis*
        5. Stipules bearing some clavate processes on margins of free blades; leaflets, especially of secondary leaves, often pseudoverticillate; calyx 6-8 mm. long, with black and pale hairs in varying proportion; plant of the Hudson Bay and northern regions .......... 4a. *O. campestris* var. *varians*
    3. Corolla purple or violet, rarely white.
      6. Pubescence of basifixed hairs; calyx (6-)6·5-8 mm. long, its teeth (1-)1·5-3 mm. long; corolla 12-18·5 mm. long; plant of the Hudson Bay region .......... 4b. *O. campestris* var. *johannensis*
      6. Pubescence of appressed, 2-armed (malpighian) hairs; calyx 7-11 mm. long, its teeth 1·2-4 mm. long; corolla 15-25 mm. long; plant chiefly of southern prairie habitats .......... 5. *O. lambertii*
1. Leaflets, or many of them, in whorls of 3 to 4; corolla bluish, violet, or purple.
  7. Legumes about 1 cm. long, only slightly exceeding the calyx-lobes; leaflets 1-2·5 cm. long .......... 1. *O. splendens*
  7. Legumes 1·2-2 cm. long below the long beak, much exceeding the calyx-lobes; leaflets 3-10 mm. long .......... 6. *O. bellii*

1. **O. splendens** Dougl. (var. *richardsonii* Hook. (*O. richardsonii* (Hook). K. Schum.); var. *vestita* Hook.)

Dry prairie and clearings in the southern three-quarters of the province. Northernmost collection: Tod Lake, 56° 45′ N., 101° 47′ W. (Ritchie, 1955). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: "Red River, and south toward Pembina" (type locality) [Hooker, 1834].

Subarctic western American: central Alaska to Great Slave L. and nw. Ont., s. to N.M., N.D., and the n. shore of L. Superior. A map of the distribution is given by Barneby [1952, map 11, p. 295].

2. **O. deflexa** (Pall.) DC. var. **sericea** T. & G. (*O. retrorsa* Fern.)

Thickets, prairie, and clearings in the southern half of the province. Northernmost collection: Nelson River between Pipestone and Cross Lakes, shore (Scoggan, 1948). Earliest collection seen: Little Saskatchewan (now Minnedosa) River, south of Riding Mountain (Macoun, 1872). First report: Barneby [1952, map 1, p. 197, showing station at Red Deer Lake, about lat. 53° N., although the Macoun specimen cited from "Red Deer Lakes" is almost certainly from that locality in Alberta, and not from "Red Deer Lake", Manitoba]. Basis of earlier citations of the main form from the province.

Subarctic western American: sw. Alaska and south-central Yukon to N.D., s. to Calif. and N.M. A map of the distribution of this and other varieties is given by Barneby [1952, map 1, p. 197].

3. **O. sericea** Nutt. var. **spicata** (Hook.) Barneby (*O. campestris* var. *spicata* Hook.; *O. macounii* (Greene) Rydb.)

Known in the province only from prairie slopes and sandhills near St. Lazare, about 75 miles northwest of Brandon, where it was first collected by Macoun & Herriot in 1906. First report: St. Lazare [Campbell collection cited in undated supplement to Lowe's 1943 checklist].

Temperate western American: central B.C. to sw. Man., s. to Ida. and Wyo. A map of the distribution is given by Barneby [1952, map 9, p. 273].

4. **O. campestris** (L.) DC. var. **gracilis** (Nels.) Barneby (*O. gracilis* (Nels.) K. Schum.; *O. monticola* Gray, in large part; *O. albertina* (Greene) Rydb.)

Dry prairie, sandhills, and clearings of southern Manitoba. Northernmost collection: Cowan, off the northeast edge of Duck Mountain, gravelly clearing (Scoggan & Baldwin, 1950). Earliest collection seen: Brandon, open prairie (Macoun, 1896). First report: Jackson *et al.* [1922; but with *O. campestris* erroneously cited in synonymy].

Temperate western American: central Alta. to south-central Man., s. to Wash. and n. Colo. A map of the distribution is given by Barneby [1952, map 8, p. 265].

4a. **O. campestris** var. **varians** (Rydb.) Barneby

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, gravelly soil (Schofield, 1950); Limestone River, about 150 miles south of Churchill, gravel shore (Schofield, 1950); Nelson River near mouth of Roblin River, gravel beach (Scoggan, 1949); Nelson River opposite Gillam Island, gravel beach (Scoggan, 1949); Herchmer, about 100 miles south of Churchill, railway gravel (Gillett, 1948); Churchill (several collections, the earliest seen being made by Macoun in 1910). First report: Churchill [Barneby, 1952]. Basis of earlier reports of the main form from the province. Probable basis of the citations of *O. hudsonica* (Greene) Fern. (*O. viscida* Nutt. var. *hudsonica* (Greene) Barneby) from Churchill by Gröntved [1936], of *O. leucantha* (Pall.) Pers. (*O. viscida* var. *subsucculenta* (Hook.) Barneby) from Churchill by Tyrrell [1897], and of *O. maydelliana* Trautv. (*O. glabrata* (Hook.) Nels.) from Churchill by Gardner [1937].

Arctic western American: north-central Alaska, n. coast of Mack., and sw. Victoria I., s. to nw. B.C. and n. Man. A map of the distribution is given by Barneby [1952, map 8, p. 265].

4b. **O. campestris** var. **johannensis** Fern. (*O. johannensis* Fern.)

Known in the province only from Churchill, where it was collected by Miss Eva Beckett in 1953. First report: Churchill [Ritchie, 1956]. Probable basis of the citation of *O. monticola* Gray ("fleures mauve-violettes") from Churchill by Gardner [1937].

(Subarctic-)temperate eastern American: ne. Man.; s. James Bay; e. Que. to Nfld., s. to Me. A map of the eastern part of the distribution is given by Barneby [1952, map 8, p. 265].

5. **O. lambertii** Pursh

Dry prairie, sandhills, and clearings of southern Manitoba. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, dry limestone substratum (Scoggan, 1951). Earliest collection seen: Winnipeg Valley (Bourgeau, 1859). First report: Red River [Hooker, 1834].

Temperate western American: Mont. to Man., s. to Wyo., Okla., and nw. Mo.; reported from Great Slave Lake, but so-named specimens from that locality in the National Herbarium of Canada lack the requisite malpighian pubescence of this species. A map of the distribution is given by Barneby [1952, map 10, p. 286].

6. **O. bellii** (Britt.) Palibine [*See* Fernald, Rhod. 30: 150-152. 1928.]

A single specimen has been seen from Long Point, near the Keewatin boundary north of Churchill, where it was collected by W. C. Güssow in 1932. First report: the present publication.

Arctic eastern American: central Keewatin to Melville Pen. near the Arctic Circle and Digges I., Hudson Str., s. to Long Point, Man.

## 10. ASTRAGALUS L.

(Milk-Vetch)

1. Leaves digitate, the 3 silvery-silky leaflets 1-2 cm. long, oblanceolate, acute; corolla yellowish-white with purplish-tipped keel; pods silky, 7-10 mm. long; plant nearly stemless........................................................1. *A. triphyllus*
1. Leaves pinnate with 5-31 leaflets.
    2. Pods sessile or nearly so within the calyx.
        3. Pods fleshy, 1·5-2 cm. thick, indehiscent or only partially so at maturity, then thick-walled and corky; corolla purple; calyx-tube 8-10 mm. long; leaflets 15-21; stems spreading on the ground..............................2. *A. caryocarpus*
        3. Pods dry, readily dehiscent; stem (when evident) ascending.
            4. Calyx-tube 2·5-3·5 mm. long.

5. Corolla yellowish-white, 8-10 mm. long; peduncles mostly shorter than the leaves; lower surface of leaves pubescent with appressed malpighian hairs (attached laterally below middle); stems cespitose, very short...3. *A. lotiflorus*

5. Corolla purple (rarely whitish); peduncles mostly exceeding the leaves, the latter pubescent beneath with simple basifixed hairs; stems elongate.

6. Pods linear, 1·2-2·2 cm. long, sparsely hairy; leaflets 15-25...4. *A. flexuosus*

6. Pods ellipsoid or ovoid, 7-12 mm. long, black-hairy; leaflets 5-17.

7. Pods about 7 mm. long, ascending to horizontally spreading at maturity; mature racemes up to 6 cm. long; leaves 2-5 cm. long, the 5-13 leaflets 4-7 mm. long..........12. *A. yukonis*

7. Pods 7-12 mm. long, strongly reflexed at maturity; mature racemes up to 15 cm. long; leaves up to 10 cm. or more long, the 9-17 leaflets 6-25 mm. long..........14. *A. eucosmus*

4. Calyx-tube 3·5-10 mm. long.

8. Calyx-tube 7-10 mm. long; pods 1-2·5 cm. long; leaflets 9-17.

9. Corolla purple; pods short-hairy; racemes capitate; leaflets elliptic, 5-10 mm. long, pubescent beneath with appressed malpighian hairs (attached laterally below middle); plant nearly stemless..........6. *A. missouriensis*

9. Corolla yellowish-white; pods glabrous; racemes 4-7 cm. long; leaflets narrowly linear, 2-6 cm. long, pubescent beneath with simple basifixed hairs; stems elongate..........7. *A. pectinatus*

8. Calyx-tube 3·5-6 mm. long; stems elongate.

10. Pods reflexed, 7-12 mm. long, densely black-hairy; corolla deep purple; leaflets 9-17..........14. *A. eucosmus*

10. Pods erect or ascending.

11. Pods glabrous, 1-2 cm. long; corolla greenish-white to creamy; racemes up to 2 dm. long; leaflets 15-31, pubescent beneath with appressed malpighian hairs..........8. *A. canadensis*

11. Pods hairy; corolla purple (sometimes white); racemes 2-4 (-5) cm. long; leaflets 13-25.

12. Pubescence of appressed malpighian hairs (attached near middle); pods densely strigose..........9. *A. striatus*

12. Pubescence of simple hairs; pods densely hirsute....10. *A. goniatus*

2. Pods stipitate within the calyx, spreading or reflexed; pubescence of simple basifixed hairs.

13. Corolla blue or purple.

14. Stems mat-forming; calyx-tube 2·5-3 mm. long; racemes 2-4 cm. long; pods 9-12(-13) mm. long, densely black-hairy..........17. *A. alpinus*

14. Stems ascending; calyx-tube about 4 mm. long; racemes 5-10 cm. long; pods 12-15 mm. long, white-strigose..........5. *A. bisulcatus*

13. Corolla yellowish-white; pods glabrous, at least when mature.

15. Calyx-tube about 5 mm. long, glabrous except for ciliate margin, its broadly deltoid teeth very short; corolla about 15 mm. long; stipules 1-2 cm. long, foliaceous..........13. *A. americanus*

15. Calyx-tube 1·5-4 mm. long, pubescent (at least in youth), its teeth subulate; corolla 6-10 mm. long; stipules less than 1 cm. long.

16. Calyx-tube 1·5-2 mm. long, sparsely strigose or glabrate; peduncles 1-2 cm. long; pods 1-celled, 8-15 mm. long..........11. *A. tenellus*

16. Calyx-tube 3-4 mm. long, densely black-hairy; peduncles 3-10 cm. long; pods partially 2-celled, up to 2 or 3 cm. long.

17. Leaflets lance-oblong or oblong (rarely linear), loosely and densely villous on both sides..........15. *A. aboriginorum*

17. Leaflets linear, greyish-strigose or glabrate..........16. *A. linearis*

### 1. A. **triphyllus** Pursh (*Orophaca cespitosa* (Nutt.) Britt.)

Two specimens have been seen from "East crossing Souris River", west of Turtle Mountain (Burgess, 1874, dry gravelly banks; Macoun, 1874, river bank). First report: "First crossing Souris River" [Dawson, 1875]. Reported also from dry sands and gravelly hills at Reston and Lyleton, southwestern Manitoba, by Lowe [1943].

Temperate western American: Sask. and sw. Man., s. to Mont., Wyo., and Neb.

2. **A. caryocarpus** Ker (*A. crassicarpus* Nutt.; *Geoprumnon crassicarpum* (Nutt.) Rydb.) Ground-plum. Buffalo-bean

Dry prairie of southern Manitoba. Northernmost collection: Stony Mountain, north of Winnipeg (Lowe, 1935). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, gravelly ridge (Burgess, 1873). First report: Red River prairie and near Pembina escarpment [Dawson, 1875]. Erroneously reported from Churchill by McClure [1943].

Temperate western American: Alta. to s. Man. and Minn., s. to Ariz., Tex., and Tenn. A map of the distribution is given by Fassett [1939p. 66].

3. **A. lotiflorus** Hook. (*Batidophaca lotiflora* (Hook.) Rydb. Low Milk-Vetch

Specimens have been seen from the following localities: Treesbank, about 20 miles southeast of Brandon (Criddle, 1930); Wawanesa, about 20 miles southeast of Brandon, denuded prairie crest above Souris River (Scoggan, 1953). Reported from Carberry by Lowe [1943], but the only so-named specimen seen from that locality (C. R. Hopper, undated) is referable to *A. missouriensis*. First report: Jackson *et al.* [1922].

Temperate western American: B.C. to s. Man. and Minn., s. to N.M., Mo., and Ia.

4. **A. flexuosus** Dougl. (*Pisophaca flexuosa* (Dougl.) Rydb.)

Prairie and clearings of southern Manitoba. Northernmost collection: Dropmore, about 100 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Garry, "dry soils throughout the prairie region" (Macoun, 1872). First report: Red and Assiniboine rivers [Hooker, 1830].

Temperate western American: Alta. to s. Man. and Minn., s. to N.M. and Kans.

5. **A. bisulcatus** (Hook.) Gray (*Diholcus bisculatus* (Hook.) Rydb.)

Prairie and clearings of southern Manitoba. Northernmost collection: Roblin, south of Duck Mountain (Simpson, 1938). Earliest collection seen: Portage la Prairie, "dry slopes throughout the prairie region" (Macoun, 1872). First report: "Very abundant on dry slopes, from Fort Ellice westward across the prairies" [Macoun, 1883].

Temperate western American: Alta. to s. Man., s. to Ida., Colo., and Neb.

6. **A. missouriensis** Nutt. (*Xylophacos missouriensis* (Nutt.) Rydb.)

Specimens have been seen from the following localities: Baldur, about 45 miles southeast of Brandon (Criddle, 1930); Carberry, about 25 miles east of Brandon (Hopper; undated); Brandon, dry prairie hillside (Stevenson, 1953); Oak Lake, about 30 miles west of Brandon, denuded prairie slope above Assiniboine River (Scoggan, 1953); Miniota, about 50 miles west-northwest of Brandon (Bird, 1949). First report: near Short Creek, Souris River, dry hillsides [Dawson, 1875].

Temperate western American: Alta. to s. Man. and w. Minn., s. to N.M. and Okla.

7. **A. pectinatus** Dougl. (*Cnemidophacos pectinatus* (Dougl.) Rydb.)

Specimens have been seen from the following localities: "First crossing Souris River", west of Turtle Mountain (Burgess, 1874); Souris Co. (Walker, 1889); "Sturch's Range, extreme southwestern corner of the province" (Jackson, 1921); Lyleton, about 80 miles southwest of Brandon (Allen, 1937); Sinclair, about 60 miles west-southwest of Brandon, roadside bank (Frankton & Bibbey, 1947); Gypsumville, about 125 miles north of Portage la Prairie (Simpson, 1934; probably introduced in quarry vicinity). Reported also from Lauder, Melita, and Tilston by Lowe [1943]. First report: "First crossing Souris River", dry, open prairie [Dawson, 1875].

Temperate western American: Sask. and s. Man., s. to Mont., Utah, and Kans.

8. **A. canadensis** L.

Prairie, thickets, rock outcrops, and clearings in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, rocky island and portage through woods (Scoggan, 1948). Earliest collection seen: Turtle Mountain, thickets (Burgess, 1873). First report: York Factory [Hooker, 1834]. This northern citation remains to be verified, and may be referable to *A. americanus*. Basis of the listing of *A. carolinianus* L. by Jackson *et al.* [1922].

(Subarctic-)temperate American: B.C. and north-central Alta. to central Man. and sw. Que., s. to Colo.,.Tex., Ark., and Va. A map of the distribution is given by Fassett [1939, p. 73].

9. **A. striatus** Nutt. (*A. adsurgens* Hook., not Pall.)

Prairie and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, gravel pit (Schofield, 1950). Earliest collection seen: Portage la Prairie (McMorine, 1891). First report: Burman [1910]. Basis of earlier reports of *A. adsurgens* Pall. from the province [Bourgeau, in Palliser, 1863; Bell, 1880; Macoun, 1883; Christy, 1887].

Subarctic western American: south-central Yukon and nw. Mack. to north-central Man., s. to N.M., Kans., and w. Minn.

10. **A. goniatus** Nutt. (*A. agrestis* Dougl.; *A. hypoglottis* of Am. auth., not L.)

Prairie, rock outcrops, and clearings in the southern three-quarters of the province. Northernmost collection: Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Lowe [1943]. Basis of earlier reports of *A. hypoglottis* from the province by Hooker [1834], Dawson [1875], Bell [1880], Burman [1910], and Jackson *et al.* [1922].

(Subarctic-)temperate western American: s. Yukon to n. Man., s. to n. Calif., N.M., and Ia.; isolated at Albany on the west coast of James Bay.

11. **A. tenellus** Pursh (*A. multiflorus* Gray; *Homalobus tenellus* (Pursh) Britt.) Loose-flowered Milk-Vetch

Prairie and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, clay soil, hillside (Schofield, 1950). Earliest collection seen: Brandon, banks of Assiniboine River (Macoun, 1896). First report: Burman [1910].

Subarctic western American: south-central Yukon and nw. Mack. to north-central Man., s. to N.M. and Minn.

12. **A. yukonis** M. E. Jones (*Phaca yukonis* (Jones) Rydb.; *Homalobus retusus* Rydb.)

Specimens have been seen from the following localities: Pipestone Lake, northeast of Lake Winnipeg, cobble beach (Scoggan, 1948); Cross Lake, northeast of Lake Winnipeg, trail through woods (Scoggan, 1948). First report: the present publication.

(Arctic-)subarctic western American: central Alaska and coast of nw. Mack., s. to s. Yukon, n. Alta., and central Man.

13. **A. americanus** (Hook.) M. E. Jones (*A. frigidus* (L.) Gray var. *americanus* (Hook.) Wats.; *Phaca americana* (Hook.) Rydb.)

Wooded river-banks and clearings of central Manitoba. Northernmost collection: Hayes River at The Rock, about 100 miles southwest of York Factory, wooded shore (Scoggan, 1949). Southernmost collection: Cowan, off the northeast edge of Duck Mountain, gravelly clearing (Scoggan, 1950). Earliest collection seen: Hill Lake, north of Lake Winnipeg, sandy ridge (Scoggan, 1948). First report: Nelson River near Hudson Bay [Macoun, 1883]. Basis of the report of *A. frigidus* from Nelson River by Bell [1880].

Subarctic western American: central Alaska to Great Slave L., north-central Man., and Severn R., Ont., s. to s. B.C., Mont., Wyo., and S.D.

14. **A. eucosmus** Robins. (*A. oroboides* var. *americanus* Gray; *Atelophragma elegans* (Hook.) Rydb.)

Shores and open ground in the northern third of the province. Northernmost collection: Churchill River, Man. (Bell, 1879). Southernmost collection: Gillam, about 165 miles south of Churchill, gravel pit

(Schofield, 1950). Earliest collection seen: the foregoing Churchill River specimen. First report: Churchill River [Macoun, 1883].

(Arctic-)subarctic American: n. Alaska to n. Que., s. Baffin I., n. Lab., and Nfld., s. to Colo. and Me.

15. A. **aboriginorum** Richardson (*Atelophragma aboriginum* (Richards.) Rydb.)

Specimens have been seen from the following localities: Gimli, about 45 miles north of Winnipeg (Buller, 1918; Dudley, 1930; Jackson, undated); Fort Ellice, about 70 miles northwest of Brandon, open prairie (Macoun, 1879). Reported also from Rossburn and Turtle Mountain by Lowe [1943], but no supporting specimens have been seen. First report: Lake Winnipeg [Hooker, 1830].

(Arctic-)subarctic western American: central Alaska to Great Bear L. and Coronation Gulf, s. to Utah, Colo., and S.D.; e. Asia; in the Gaspe Pen. of e. Que., the closely related *A. scrupulicola* Fern. & Weath.

16. A. **linearis** (Rydb.) A. E. Porsild (*Atelophragma lineare* Rydb.; *A. herriotii* Rydb.)

Specimens have been seen from the following localities: St. Lazare, about 75 miles northwest of Brandon, prairie slope (Macoun & Herriot, 1906; Scoggan, 1951); Miniota, about 50 miles west-northwest of Brandon, denuded prairie slope above Assiniboine River (Scoggan, 1953). First report: the present publication. This species is considered by Hultén [1947] to be merely the mature phase of the foregoing one.

(Arctic-)subarctic western American: n. Alaska and nw. Mack., s. to s. Alaska and sw. Man.

17. A. **alpinus** L. (*Atelophragma alpinum* (L.) Rydb.; *Phaca astragalina* DC.)

Prairie, shores, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first seen being one made by Macoun in 1910). Earliest collection seen: Birtle, about 60 miles northwest of Brandon (Macoun & Herriot, 1906). First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (n. to Prince Patrick I.), n. Que., n. Lab. and Nfld., s. to Colo., S.D., n. Wisc.; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXIX].

*A. drummondii* Dougl. (*Tium drummondii* (Dougl.) Rydb.) is cited from Angusville by Lowe [1943], but the specimen concerned is referable to *Oxytropis deflexa* var. *sericea*.

*A. neglectus* (T. & G.) Sheldon reported from near Aweme by Criddle [1927] is accredited to Manitoba by Fassett [1939], but no specimens have been seen, and it should be excluded from our flora for the present.

### 11. GLYCYRRHIZA L.

1. **G. lepidota** (Nutt.) Pursh   Wild Licorice

Prairie, thickets, and clearings in the southern fifth of the province. Northernmost collection: Roblin, south of Duck Mountain, grassy clearing (Scoggan, 1951). Earliest collection seen: Portage la Prairie, thicket (Macoun, 1872). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880]. This northern citation, however, is probably referable to some other species.

Temperate western American: Wash. and s. Alta. to Lake of the Woods district, Ont., s. to Mex., Tex., and nw. Mo. A map of the distribution is given by Fassett [1939, p. 79].

### 12. HEDYSARUM L.

[*See* Rollins, Rhod. 42: 217-239. 1940.]

1. Flowers 1-1·5 cm. long, pink or magenta; teeth of calyx-tube deltoid to lanceolate; venation of segments of pod irregularly quadrate.
  2. Pods glabrous to very sparingly pubescent along the margins ........................................................ 1. *H. alpinum* var. *americanum*
  2. Pods pubescent on both surfaces .................... 1a. *H. alpinum* var. *philoscia*
1. Flowers 1·5-2·3 mm. long, deep purple; teeth of calyx-tube linear, equalling or longer than the tube; pods minutely pubescent, their segments with transversely elongate venation ............................................................ 2. *H. mackenzii*

1. **H. alpinum** L. var. **americanum** Michx. (*H. americanum* (Michx.) Britt.; *H. boreale* of auth., not Nutt.)

Prairie, thickets, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, gravel pit (Schofield, 1950), Earliest collection seen: Brandon (Bedford, 1893). First report: Riding Mountain [Halliday, 1932]. Basis of the listing of *H. boreale* by Burman [1910], Jackson *et al.* [1922], Criddle [1927], Bird [1927], Gardner [1937], and Radforth [1950].

(Arctic-)subarctic American: Seward Pen., Alaska, and coast of Yukon and Mack. to n. Que., s. Lab., and Nfld., s. to B.C., e. Que., Vt., and Me.; the main form European. A map of the distribution is given by Raup [1947, pl. XXX].

1a. **H. alpinum** var. **philoscia** (A. Nels.) Rollins

Specimens have been seen from the following localities: banks of Hargrave River near Hill Lake, north of Lake Winnipeg (Scoggan, 1948); Grand Rapids, off the northwest end of Lake Winnipeg, clearing on limestone substratum (Scoggan, 1948). First report: the present publication.

Temperate western American: Alta. to Man., s. to Wyo. and S.D.

2. **H. mackenzii** Richardson

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill (Schofield, 1950); Hayes River, about 40 miles from York Factory, clay-gravel floodplain (Scoggan, 1949); Nelson River, about 30 miles west-southwest of York Factory, gravel beach (Scoggan, 1949); Churchill (several collections, the first seen being that of Bell in 1884). First report: between York Factory and Churchill [Rae, 1850].

Arctic American: n. coast of Alaska, Yukon, and Mack., Banks I., Victoria I., central Keewatin, and Nfld., s. to s. Alta., James Bay, and Anticosti I., Que.; Siberia. A map of the American distribution is given by Raup [1947, pl. XXX].

Forma *niveum* Boivin [Can. Field-Nat. 65: 20. 1951], with white petals, has been found at Churchill (Dorothy Brown, gravel ridge in swampy flats, 1950; Eva Beckett, 1953).

## 13. DESMODIUM Desv.

### (Tick-trefoil)

1. **D. canadense** (L.) DC. (*Meibomia canadensis* (L.) Ktze.)

Specimens have been seen from the following localities: Lake of the Woods, Man., rich woods (Burgess, 1873); Winnipeg (Buller, 1918); Morden, about 60 miles southwest of Winnipeg, thickets along stream (Macoun, 1896); Aweme, about 20 miles southeast of Brandon (Criddle, 1926). First report: "Throughout Canada, as far as Norway-House" [Hooker, 1834]. This northern citation requires verification.

Temperate eastern American: Man. to N.S., s. to Okla., O., and Va. A map of the distribution is given by Fassett [1939, p. 98].

## 14. VICIA L.

### (Vetch)

1. Flowers solitary or paired in the upper leaf-axils, subsessile, 12-18 mm. long.......... ..............................................................1. *V. angustifolia*

1. Flowers 3-many in 1-sided long-peduncled racemes.

  2. Mature racemes shorter than the subtending leaves, their 3-9 flowers each 1·5-2 cm. long; leaflets 4-9 pairs, their lateral veins prominent and rib-like beneath on drying; stipules sharply serrate.

    3. Leaflets elliptic to oblong or oblong-ovate.

      4. Leaflets rounded or tapering at apex..........................2. *V. americana*

      4. Leaflets truncate at apex......................2a. *V. americana* var. *truncata*

    3. Leaflets linear or linear-oblong.................2b. *V. americana* var. *angustifolia*

  2. Mature racemes mostly equalling or longer than the subtending leaves, their 10-many flowers 1-1·5 cm. long; leaflets mostly 8-12 pairs, not prominently veiny; stipules entire.

    5. Pedicels appearing ventrally attached to the calyces (the latter prolonged backward beyond the point of insertion); upper calyx-lobes linear-triangular, 0·8-1·5 mm. long; flowers 14-15 mm. long; plant more or less spreading-villous throughout, especially above..........................................3. *V. villosa*

    5. Pedicels basally attached; upper calyx-lobes broadly triangular, 0·3-0·7 mm. long; flowers 10-13 mm. long; plant more or less appressed-pubescent.......4. *V. cracca*

1. V. ANGUSTIFOLIA Reichard  Common Vetch

A single specimen has been seen, from Fort Garry, Winnipeg, where it was collected on moist prairie by Lowe in 1941. First report: Fort Garry

[Lowe, 1943]. Possible basis of the citation of *V. sativa* L. from Red River by Bourgeau [in Palliser, 1863].

European: naturalized in North America.

2. **V. americana** Muhl.

Prairie, thickets, woods, and clearings almost throughout the province except the extreme north. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: Brandon, thickets (Macoun, 1896). First report: Dufferin [Dawson, 1875].

(Subarctic-)temperate American: se. Alaska to n. Man., s. James Bay, and w. Que., s. to Calif., N.M., Kans., Ark., O., and Va. A map of the American distribution, on which the Churchill station should be indicated, is given by Fassett [1939, p. 111].

2a. **V. americana** var. **truncata** (Nutt.) Brewer (*V. oregana* Nutt.)

Known only from the southern third of the province, but probably occurring throughout the area of the main form. Northernmost collection: Porcupine Mountain, woods (Scoggan, 1950). Earliest collection seen: Souris River south of Brandon, prairie slope (Scoggan, 1950). First report: (with citation of localities): the present publication; but Manitoba is included in the range given by Fernald [1950].

Temperate western American: B.C. to Man., s. to Calif. and Mo.

2b. **V. americana** var. **angustifolia** Nees (var. *minor* Hook.; var. *linearis* (Nutt.) Wats.; *V. sparsifolia* Nutt.)

Known only from the southern half of the province, but probably occurring throughout the area of the main form. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, clearing in woods (Scoggan, 1948). Earliest collection seen: near Turtle Mountain, open prairie (Dawson, 1873–74). First report: Red River [Hooker, 1834; var. *minor*].

Temperate western American: B.C. to Man., s. to Calif., N.M., Okla., and Ia.

3. V. VILLOSA Roth Hairy Vetch

Known in the province only from Brandon, where it was collected in grassland by G. Stevenson in 1953. First report: the present publication. First reported as new to Canada (from Ontario) by J. M. Macoun [1906].

European: naturalized in North America.

4. V. CRACCA L. Tufted Vetch. Canada-pea

Fields and clearings in the southern three-quarters of the province. Northernmost collection: York Factory, clearing (Scoggan, 1949). Earliest collection seen: Brandon, street (Macoun, 1896). First report: Fort Garry [Macoun & Gibson, 1877].

European: widely naturalized in North America.

## 15. LATHYRUS L.

## (Vetchling. Wild Pea)

1. Leaflets a single pair.
  2. Flowers pink to violet, about 1·5 cm. long; roots tuberous............5. *L. tuberosus*
  2. Flowers bright yellow, 1·3-2 cm. long; roots not tuberous..............*L. pratensis*
1. Leaflets two or more pairs.
  3. Flowers yellowish-white; leaflets ovate or elliptic; principal stipules semicordate.........................................................4. *L. ochroleucus*
  3. Flowers bluish or purple.
    4. Stipules essentially symmetrical, nearly as large as the leaflets.
      5. Plant essentially glabrous; tendrils mostly forking.
        6. Flowers 1·5-2·5 cm. long......................1. *L. japonicus* var. *glaber*
        6. Flowers less than 1·5 cm. long...............*L. japonicus* var. *parviflorus*
      5. Plant more or less pubescent; tendrils mostly simple ...............................................................1a. *L. japonicus* var. *aleuticus*
    4. Stipules semisagittate, much smaller than the leaflets.
      7. Leaves longer than the inflorescence, mostly with 5-6 pairs of ovate leaflets.........................................2. *L. venosus* var. *intonsus*
      7. Leaves shorter than or about equalling the inflorescence, mostly with 2-5 pairs of linear to elliptic leaflets.
        8. Plant essentially glabrous...............................3. *L. palustris*
        8. Plant finely pubescent.......................3a. *L. palustris* var. *pilosus*

1. **L. japonicus** Willd. var. **glaber** (Ser.) Fern. (*L. maritimus* (L.) Bigel. var. *glaber* (Ser.) Eames) Beach-Pea

Shores of lakes Winnipeg and Manitoba, and coast of Hudson Bay. Northernmost collection: Churchill, gravelly places near the coast (Bell, 1879). Earliest collection seen: Lake Winnipeg valley (Bourgeau, 1857). First report: Lake Winnipeg valley [Fernald, Rhodora 34: 182. 1932]. Probable basis of most reports of the main form from the province.

(Subarctic-)temperate circumpolar: B.C. to Calif.; n. Man. to Nfld., s. to the Great Lakes and N.Y.; Eurasia. A map of the American distribution, on which the Churchill station should be indicated, is given by Fassett [1939, p. 118].

1a. **L. japonicus** var. **aleuticus** (Greene) Fern. (L. *maritimus* var. *aleuticus* Greene)

Known in the province only from Churchill, where it was collected on the gravelly sea-coast by Bell in 1879. First report: the present publication.

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to n. Man., n. Que., central Lab., and Nfld., s. to se. Alaska, the Great Lakes, and N.B.; s. Greenland; n. Eurasia.

*L. japonicus* var. *parviflorus* Fassett: Lake Winnipeg is included in the range assigned this variety by Fernald [1950], but no specimens have been seen, and it should be excluded from our flora for the present.

2. **L. venosus** Muhl. var. **intonsus** Butt. & St. John

Prairie, thickets, woods, and clearings in the southern half of the province. Northernmost collection: The Pas (Krivda, 1949). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, thickets (Burgess, 1873). First report: Lake Winnipeg valley [Butters & St. John, Rhodora 19: 159. 1917]. Basis of earlier reports of the main form from the province.

Temperate American: B.C. to e. Que., s. to N.D., Mo., and Tenn.

3. **L. palustris** L. (Incl. var. *linearifolius* Ser. and var. *myrtifolius* (Muhl.) Gray (*L. myrtifolius* Muhl.)) Vetchling

Shores, damp thickets, and meadows in the southern three-quarters of the province. Northernmost collection: York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: High Bluff, near Portage la Prairie (Hargrave, 1883). First report: north end of Lake Winnipeg [Bell, 1880].

(Subarctic-)temperate circumpolar: B.C. to Nfld., s. to Colo., Tex., and N.C.; Eurasia. Maps of the American distribution of the typical form and of var. *linearifolius* and var. *myrtifolius* are given by Fassett [1939, pp. 121, 119, and 124, respectively]. The writer agrees with Hultén [1947] that these three glabrous types are best regarded as a single population with wide but continuous variation in leaf-width.

3a. **L. palustris** var. **pilosus** (Cham.) Ledeb. (Incl. var. *macranthus* (White) Fern.)

Similar habitats in the southern half of the province. Northernmost collection: The Pas (Krivda, 1952). Earliest collection seen: Brandon, willow thicket (Macoun, 1896). First report: Fassett [1939; map, p. 124, showing stations in southern Manitoba for var. *macranthus*].

Subarctic American: central Alaska to central Man., Lab., and Nfld., s. to Oreg., N.D., and Conn.; e. Asia. In addition to the map for var. *macranthus*, one is given by Fassett for var. *pilosus* [1939, p. 126]. Consistent with the treatment of the glabrous plant, the writer here follows Hultén [1947] in regarding the two pilose forms as a single population of wide but continuous variation in leaf-width.

4. **L. ~~a~~ochroleucus** Hook. Pale Vetchling

Woods, thickets, sandhills, and rock outcrops in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, sandy railroad bank (Schofield, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Red River [Hooker, 1834].

Subarctic American: south-central Mack. to James Bay and s. Que., s. to Oreg., S.D., O., and Pa. A map of the distribution is given by Fassett [1939, p. 118].

5. L. TUBEROSUS L. Tuberous Vetchling

Known in the province only from Fort Garry, Winnipeg, where it was collected by Mrs. H. A. Fowler in 1953. The sheet, in the National

Herbarium of Canada, bears the annotation "Many ditches and brush piles. No doubt a sometime garden escape, but appears to be establishing itself." First report: the present publication.

European: naturalized in North America.

*L. pratensis* L., Yellow Vetchling, is reported from railway ballast between Carberry and Macgregor by Shimek [1927], but no specimens have been seen, and it should be excluded from our flora for the present.

### 16. AMPHICARPA Ell.

### (Hog-Peanut)

1. **A. bracteata** (L.) Fern. (Incl. var. *comosa* (L.) Fern.; *A. monoica* (L.) Ell.)

Thickets and damp woodlands of southern Manitoba. Specimens have been seen from the following localities: Winnipeg area (several collections, the first by Macoun in 1896); Portage la Prairie (Macoun & Herriot, 1906); Rock Lake, about 50 miles southeast of Brandon (Scoggan, 1953); Brandon (Macoun, 1896). First report: Winnipeg and Brandon [J. M. Macoun, 1897].

Temperate eastern American: s. Man. to Que., s. to Tex. and Fla. Maps of the distribution of the main form and var. *comosa*, with which it intergrades, are given by Fassett [1939, pp. 125 and 130, respectively].

*Tephrosia virginiana* (L.) Pers. (*Cracca virginiana* L.), Goat's-rue, is accredited to Manitoba in the range given by Rydberg [1932], and is included on this basis in Lowe's checklist. No specimens have been seen, however, nor is it reported from the province in the monographic treatment by Wood [Rhodora 51: 269. 1949], and it should be excluded from our flora.

*Cicer arietinum* L., Chick-Pea: a specimen has been seen from Erickson, about 45 miles north of Brandon (Percival, 1922). It is also reported from Winnipeg, Selkirk, and St. Eustace by Groh & Frankton [1949]. It is probably not persistent.

*Trigonella caerulea* (L.) Ser., an annual plant with trifoliate leaves and long-peduncled heads of blue-and-white flowers, is under cultivation in the forage area of the Brandon Experimental Farm, and, according to G. Stevenson, spreads as an occasional weed. It cannot be considered a naturalized entity of our flora.

*Caragana arborescens* Lam., Pea Tree, with clusters of showy yellow flowers, is extensively planted as hedges and windbreaks, and apparently sometimes escapes.

*Lupinus argenteus* Pursh: Dr. B. Boivin has kindly directed the writer's attention to a collection made in a hayfield near Melita by H. H. Marshall in 1954, the first from the province. It was presumably a casual introduction from farther west.

## 58. LINACEAE

### (Flax Family)

### 1. LINUM L.

### (Flax)

1. Sepals glandular-serrate; fruiting pedicels mostly less than 1 cm. long; petals yellow.
   2. Valves of the capsule blunt or subacute at apex, brown with a cartilaginous thickening at base; styles free only at tips; sepals soon deciduous................1. *L. rigidum*
   2. Valves of the capsule with beak-like tips, their bases not thickened; styles free nearly to base; sepals persistent..........................................2. *L. sulcatum*

1. Sepals without marginal glands; fruiting pedicels 1-4 cm. long; petals blue (rarely white).
  3. Sepals long-acuminate, the inner ones with ciliate margins; stigmas linear; pedicels erect; stems mostly simple at base............................3. *L. usitatissimum*
  3. Sepals rounded or obtuse, their margins non-ciliate; stigmas capitate; pedicels arching; stems often much branched at base................................4. *L. lewisii*

1. **L. rigidum** Pursh (*Cathartolinum rigidum* (Pursh) Small) Yellow Flax

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Oak Point, about 55 miles northwest of Winnipeg, grassy prairie (Scoggan, 1951). Earliest collection seen: Stony Mountain, near Winnipeg, rocky places (Macoun, 1896). First report: Burman [1910].

Temperate western American: Alta. to Man., s. to N.M., Tex., and n. Mex.; adventive farther east.

2. **L. sulcatum** Riddell (*Cathartolinum sulcatum* (Riddell) Small) Yellow Flax

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Fort Ellice, about 70 miles northwest of Brandon, dry sandy soil (Macoun, 1879). Earliest collection seen: Fort Garry and Assiniboine River (Schultz, 1861). First report: near Fort Ellice [Macoun, 1883].

Temperate American: Sask. to Vt., s. to Tex., Ark., Ala., and Ga.

3. L. USITATISSIMUM L. Common Blue Flax

Fields and clearings in the southern half of the province. Northernmost collection: The Pas, railway ballast (Krivda, 1950). Earliest collection seen: Brandon, streets and waste places (Macoun, 1896). First report: Burman [1910].

European: widely naturalized in North America, often escaped from cultivation.

4. **L. lewisii** Pursh (*L. perenne* L. subsp. *lewisii* (Pursh) Hultén) Blue Flax

Dry prairie and clearings of southern Manitoba. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, dry limestone substratum (Scoggan, 1951). Earliest collection seen: "Manitoba", plains (Macoun, 1872). First report: Jackson *et al.* [1922]. Basis of the citation of *L. perenne* L. from the Red River prairie by Dawson [1875] and from Carberry by Christy [1887], and of *L. pratense* (Norton) Small from Deloraine by Lowe [1943].

Arctic American: n. Alaska, n. coast of Mack., and Victoria I. to James Bay and s. Ont., s. to s. Calif., n. Mex., and Wisc.

In addition to the typical plant of southern Manitoba, there occurs at Churchill a white-flowered form, to which the name *L. lepagei* has been given by Boivin (Naturaliste Canadien 75: 219. 1948): (Beckett, 1946, dry hillsides; Beckett, 1948, warm sandy places; Gillett, 1948, sand area; Brown, 1950, sand dune). All material seen has the non-ciliate sepals and other characters of the typical form, apart from the albino petals, and segregation as a distinct species appears unwarranted. A collection from Long Island, off the east coast of Hudson Bay just to the north of James Bay (Baldwin, No. 1768, July 25-28, 1949), consists of a mixture of the blue-flowered and white-flowered forms.

## 59. OXALIDACEAE

### (Wood-Sorrel Family)

### 1. OXALIS L.

### (Wood-Sorrel)

1. Petals whitish, with lilac or red lines; flowers solitary; leaves and scapes all basal.......... *O. montana*

1. Petals yellow; plants leafy-stemmed.
    2. Stems prostrate and often rooting at many nodes, non-stoloniferous; stipules broad, brownish or purplish; peduncles 1-5-flowered, the pedicels reflexing in fruit.......... 1. *O. corniculata*
    2. Stems ascending, not rooting above the base.
        3. Fruiting pedicels spreading or ascending; stipules obsolete or nearly so; leaflets 0·6-4 cm. broad; flowers 1-9 in cymose umbels; capsules 0·5-1·5 cm. long; fleshy stolons often present at maturity.......... 2. *O. europaea*
        3. Fruiting pedicels deflexed; stipules oblong; leaflets 1-2 cm. broad; flowers 1-4 in umbels; capsules 1·5-2·5 cm. long; stolons wanting.
            4. Capsules with some long viscid hairs intermixed with the fine puberulence.......... 3. *O. stricta*
            4. Capsules lacking viscid hairs.......... 3a. *O. stricta* var. *piletocarpa*

1. O. CORNICULATA L. (*O. repens* Thunb.; *Xanthoxalis corniculata* (L.) Small) Creeping Lady's-Sorrel

The following collections have been seen: Winnipeg (Groh, 1921; Garton, 1944, rich ground, semi-open spaces); Crystal City, about 60 miles southeast of Brandon (Thomas, 1935). First report: near Carberry, moist ground [Christy, 1887].

European: a semicosmopolitan species widely naturalized in North America.

2. **O. europaea** Jord.

Thickets and clearings in the southern half of the province. Northernmost collection: The Pas, railway ballast (Krivda, 1950). Earliest collection seen: Winnipeg (Groh, 1921). First report: the present publication; scarcely distinct from the following species and perhaps better merged with it.

Temperate American: Sask. to e. Que., s. to Ariz., Okla., Tenn., and Ga.

Forma *pilosella* Wieg., differing from the typical form in its appressed-villous stems, has been collected at Winnipeg (Groh, 1921), Aweme (Groh, 1932), Wawanesa (Groh, 1932), and Brandon (Marshall, 1949).

Forma *cymosa* (Small) Wieg., differing from the typical form in its spreading-pubescent pedicels, has been collected at Selkirk (Groh, 1934).

Forma *villicaulis* Wieg., differing from f. *cymosa* in its villous stems, has been collected at Winnipeg (Marquardt, 1932).

3. **O. stricta** L. (*Xanthoxalis stricta* (L.) Small)

Thickets, woods, gardens, and clearings in the southern half of the province. Northernmost collection: The Pas, railway ballast (Krivda, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, "meadow spaces in woods" (Burgess, 1873). First report: Dufferin [Dawson, 1875].

Temperate American: s. B.C. to P.E.I., s. to N.M., Mex., and Fla.

3a. **O. stricta** var. **piletocarpa** Wieg.

Known in the province only from Morden, where it was first collected by Groh in 1921. First report: the present publication.

Temperate American: Wyo.; P.E.I. to N.J.

*O. montana* Raf. (*O. acetosella* of auth., not L.) is accredited to Manitoba in the range given by Fernald [1950] and forms the basis for the inclusion of the province in the range given for *O. acetosella* L. by Small [N. Am. Fl. 25: 26. 1907]. No specimens have been seen from Manitoba, however, nor is it listed by Lowe [1943], and it should be excluded from our flora until such time as specimens are available. The map of Braun [Rhodora 39: 202 (fig. 27). 1937] indicates the species as extending westward to northern Minnesota, and it should be searched for carefully in Manitoba. As shown in the above "key", there is no possibility of confusing it with other members of the genus.

## 60. GERANIACEAE

(Geranium Family)

1. Leaves pinnately veined and dissected; anther-bearing stamens 5 ........... 1. *Erodium*
1. Leaves palmately veined and lobed or divided; anther-bearing stamens usually 10 ........ ........ 2. *Geranium*

### 1. Erodium L'Hér.

(Storksbill)

1. E. cicutarium (L.) L'Hér.

Fields, roadsides, and waste places. Specimens have been seen from the following localities: Winnipeg and vicinity (Marquardt, 1933; Garton, 1944, in garden; MacMillan, 1947); St. Andrews, northeast of Winnipeg (Groh, 1922); Portage la Prairie (McMorine, 1896). First report: Burman [1910].

European: widely naturalized in North America.

### 2. Geranium L.

(Cranesbill)

1. Leaves completely divided into separate pinnatifid segments, the terminal leaflet stalked ........ *G. robertianum*
1. Leaves not divided into distinct leaflets.
   2. Petals 14-25 mm. long; beak of mature style-column 5-10 mm. long; anthers 2-3 mm. long; plant perennial from a stout rhizome ........ 1. *G. pratense*
   2. Petals less than 10 mm. long; anthers less than 1 mm. long; plants annual from a slender taproot.

3. Sepals awnless, callous-tipped; mature style-column beakless........2. *G. pusillum*
3. Sepals awned; style-column beaked.
    4. Beak of mature style-column 3-5 mm. long; flowers roseate; inflorescence loose, the fruiting pedicels much longer than the calyces...............3. *G. bicknellii*
    4. Beak 1-2 mm. long; flowers pale pink or whitish; inflorescence compact, the fruiting pedicels about equalling the calyces.
        5. Pedicels, peduncles, and stem retrorsely pubescent with appressed hairs mostly less than 0·5 mm. long..........................4. *G. carolinianum*
        5. Pedicels etc. pubescent with spreading hairs about 1 mm. long...................................................4a. *G. carolinianum* var. *confertiflorum*

1. G. PRATENSE L.

Fields and roadsides. Specimens have been seen only from Winnipeg, where it was first collected by J. F. Higham in 1922. First report: the present publication. Basis of the listing of *G. maculatum* L. by Jackson *et al.* [1922] and Lowe [1943], and of *G. strigosum* Rydb. by Lowe [1943].

European: naturalized in North America.

2. G. PUSILLUM L.

Fields and roadsides. A single specimen has been seen, from Brandon, where it was collected in cultivated soil by G. Stevenson in 1953. First report: Jackson *et al.* [1922]. Reported from Winnipeg by Lowe [1943].

European: naturalized in North America.

3. **G. bicknellii** Britt.

Fields, roadsides, rock outcrops, and clearings, particularly around old camp-sites, in the southern four-fifths of the province. Northernmost collection: Knife Lake, about 120 miles southwest of Churchill, clearing (Gillett, 1948). Earliest collection seen: Dawson Road, Man. (Dawson, 1873). First report: Killarney [J. M. Macoun, 1897].

Subarctic American: central Alaska and central Yukon to n. Man. and Nfld., s. to n. Calif., Ia., and Mass.

4. **G. carolinianum** L.

Fields, rock outcrops, and clearings in the southern half of the province. Northernmost collection seen: Herb Lake, on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949.) Earliest collection seen: Winnipeg (Groh, 1921). First report: Lake Winnipeg [Bourgeau, in Palliser, 1863].

Temperate American: s. B.C. to Me., s. to Calif. and Fla.

4a. **G. carolinianum** var. **confertiflorum** Fern.

A collection from St. Lazare, about 75 miles northwest of Brandon (Scoggan, 1951, dry sandy clearing) appears referable here. First report: the present publication.

Temperate eastern American: Man. to Me., s. to Mo., Tenn., and N.C.

*G. robertianum* L., Herb-Robert, is listed from the province, without definite locality, by Burman [1910], Jackson *et al.* [1922], and Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora for the present.

# 61. POLYGALACEAE

## (Milkwort Family)

### 1. POLYGALA L.

### (Milkwort)

1. Flowers usually rose-purple, about 1·5 cm. long, long-pedicelled in a terminal cluster; lower leaves scale-like, the crowded upper ones much larger, ovate; plant with slender subterranean rhizome and stolons ........................................ 1. *P. paucifolia*

1. Flowers usually white or greenish, less than 5 mm. long, subsessile in dense terminal racemes; leaves uniform, linear to lanceolate.

   2. Leaves alternate; raceme solitary; stems several from a perennial root ........................................ 2. *P. senega*

   2. Leaves mostly whorled; racemes usually several; stem solitary, annual ........................................ 3. *P. verticillata* var. *isocycla*

1. **P. paucifolia** Willd. Fringed Polygala

Wet ground and moist woods in the southern half of the province. Northernmost collection: Bear Lake, northwest of Oxford Lake (Moore, 1953). Earliest collection seen: Aweme, about 20 miles southeast of Brandon (Criddle, 1926). First report: near Aweme [Fletcher, 1900].

Temperate eastern American: Man. to e. Que., s. to Minn., Ill., Tenn., and Ga.

2. **P. senega** L. Seneca-Snakeroot

Thickets, prairie, and clearings in the southern two-thirds of the province. Northernmost collection: "Gillam to Churchill Railway", probably near Gillam (Güssow, 1932). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, gravelly ridge (Burgess, 1873). First report: near York Factory ["H", Richardson, in Franklin, 1823].

Temperate American: Alta. to Que. and N.B., s. to S.D., Ark., Tenn., and Ga.

3. **P. verticillata** L. var. **isocycla** Fern.

Specimens have been seen from the following localities: Stony Mountain, near Winnipeg (Groh, 1922); Brandon (Macoun, 1896, open prairie; Marshall, 1947, dry hills); Griswold, about 20 miles west-southwest of Brandon (Burman, 1887, sandy soil). First report (with citation of localities): the present publication; but s. Manitoba is included in the range given by Fernald [1950]. Basis of reports of the main form from the province by J. M. Macoun [1898], Burman [1910], and Lowe [1943].

Temperate American: s. Man. to Mass., s. to Utah, Colo., Tex., and Fla.

*P. polygama* Walt.: Manitoba is included in the range assigned this species by Rydberg [1932], and it is included on this basis by Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora.

## 62. EUPHORBIACEAE

### (Spurge Family)

### 1. Euphorbia L.

### (Spurge)

1. Stems and branches mostly spreading flat on the ground; leaves oblique at base, often with a broad purplish band bordering the midrib.
  2. Leaves entire; faces of seeds smooth..................................1. *E. geyeri*
  2. Leaves toothed, at least near apex; faces of seeds pitted or ridged.
    3. Leaves linear-oblong; staminate flowers of the cup-like involucre mostly 4; faces of seeds with 5 or 6 elongate transverse ridges................2. *E. glyptosperma*
    3. Leaves oblong-linear to ovate or oblong; staminate flowers 5-18; faces of seeds slightly pitted and with short cross-ribs........................3. *E. serpyllifolia*
1. Stems erect; leaves entire and symmetrical.
  4. Uppermost leaves and leafy bracts with broad white margins; glands of involucre with white petal-like margins......................................*E. marginata*
  4. Leaves and bracts uniformly green; glands of involucre without petal-like margins.
    5. Plants perennial by widely creeping horizontal rootstocks; leaves linear to oblong; seeds smooth.
      6. Primary bracts 4-7 mm. wide; leaves 0·5-3 mm. wide; involucre 3 mm. high, its glands scarcely horned................................4. *E. cyparissias*
      6. Primary bracts 1·3-2 cm. wide; leaves 2-25 mm. wide; glands 2-horned.
        7. Principal leaves 2-10 mm. wide, bright green; bracts up to 1·3 cm. long; involucre 2·5-3 mm. high......................................5. *E. esula*
        7. Principal leaves 1-2·5 cm. wide, glaucous; bracts up to 2 cm. long; involucre 3-4 mm. high...............................................*E. lucida*
    5. Plant annual; leaves obovate to suborbicular; involucre 1·5 mm. high, its glands 2-horned; seeds sculptured...........................................6. *E. peplus*

1. **E. geyeri** Engelm. (*Chamaesyce geyeri* (Engelm.) Small)

Known in the province only from St. Lazare, about 75 miles northwest of Brandon, where it was first collected on active sand dunes by Boivin & Dore in 1951. First report: the present publication.

Temperate (interior) American: s. Man. to Wisc., s. to Colo., N.M., Tex., Neb., and Ind. A map of the greater part of the distribution is given by Wheeler [1941, map 20, p. 173].

2. **E. glyptosperma** Engelm. (*Chamaesyce glyptosperma* (Engelm.) Small)

Sandy prairie and clearings in the southern two-fifths of the province. Northernmost collection: The Pas, railway gravels (Krivda, 1954). Earliest collection seen: Brandon, open prairie (Macoun, 1896). First report: Jackson *et al.* [1922]. Probable basis of the listing of *E. maculata* L. by Burman [1910].

Temperate American: B.C. to N.B., s. to Calif., Mex., Tex., Mo., O., and N.Y. A map of the greater part of the distribution is given by Wheeler [1941, map 24 (dots), p. 173].

3. **E. serpyllifolia** Pers. (*Chamaesyce serpyllifolia* (Pers.) Small)

Sandy prairie and clearings of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy prairie

(Scoggan, 1951). Earliest collection seen: Winnipeg (Lowe, 1909). First report: Jackson *et al.* [1922].

Temperate American: B.C. to Mich., s. to Tex., N.M., Mo., and Ia.; adventive farther east. A map of the greater part of the distribution is given by Wheeler [1941, map 15, p. 118].

4. E. CYPARISSIAS L. (*Galarrhoeus cyparissias* (L.) Small) Cypress Spurge

Specimens have been seen from the following localities: near Winnipeg (Rook, 1936); Carman, about 45 miles southwest of Winnipeg (Craig, 1945); Manitou, about 75 miles southwest of Winnipeg (Marquardt, 1931); Brandon (Brownell, 1949); Boissevain, north of Turtle Mountain (Stevenson, 1941). First report: Sturgeon Creek, Winnipeg [Lowe, 1943].

European: naturalized in North America, chiefly as a garden escape.

5. E. ESULA L. (*Galarrhoeus esula* (L.) Rydb.; and incl. *E. virgata* Waldst. & Kit.) Leafy Spurge. Wolf's-milk

Prairie, fields, and roadsides of southern Manitoba. Northernmost collection: Gimli, about 45 miles north of Winnipeg (Thompson; undated). Earliest collection seen: Ogilvie, about 40 miles northwest of Portage la Prairie (West, 1913). First report: Carberry [Jackson *et al.*, 1922]. Basis of the citation of *E. lucida* Waldst. & Kit. from Gretna by Lowe [1943].

European: naturalized in North America.

6. E. PEPLUS L. (*Galarrhoeus peplus* (L.) Haw.) Petty Spurge

A single specimen has been seen, from Morden, about 60 miles southwest of Winnipeg, where it was collected by Groh in 1921. Reported also from Winnipeg and Boissevain by Groh & Frankton [1949]. First report: Morden [Jackson *et al.*, 1922].

European: naturalized in North America.

*E. marginata* Pursh (*Lepadena marginata* (Pursh) Niewl.), Snow-on-the-mountain, has been collected at Winnipeg as a garden escape, but is scarcely a naturalized entity of our flora.

*E. helioscopia* L. (*Galarrhoeus helioscopia* (L.) Haw.), Wartweed, is accredited to Manitoba in the range given by Rydberg [1932], and is listed on this basis by Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora for the present.

*E. platyphylla* L. (*Galarrhoeus platyphyllus* (L.) Haw.) is also accredited to Manitoba by Rydberg [1932], and is cited from Norway House by Macoun [1886]. No specimens have been seen, however, and it should be excluded from our flora for the present.

# 63. CALLITRICHACEAE

## (Water-Starwort Family)

### 1. CALLITRICHE L.

### (Water-Starwort)

1. Fruit longer than broad, tapering to base, up to 1·4 mm. long, sharply keeled or narrowly winged above; submersed leaves linear and 1-nerved, the floating leaves broader and 3-nerved........................................................1. *C. palustris*
1. Fruit as broad as long, rounded at base.
    2. Fruit up to 2·5 mm. broad, its divisions broadly winged; flowers bractless; leaves uniform, linear to oblong-linear, rounded or retuse at tip.......2. *C. hermaphroditica*
    2. Fruit 1-1·4 mm. long, its margins rounded; flowers 2-bracted at base; submersed leaves linear to oblanceolate; floating leaves flabelliform-obovate...........*C. heterophylla*

1. **C. palustris** L. (*C. verna* L.)

Swampy ground, shores, and ponds in the southern three-quarters of the province. Northernmost collection: York Factory, pool in landslide gully (Scoggan, 1949). Earliest collection seen: "Hill River" (that part of the Hayes system between the mouths of the Fox and Shamattawa rivers) (Bell, 1880, stagnant water). First report: Flin Flon [Lowe, 1943]. Basis of the citation of *C. anceps* Fern. from Cochrane River by Baldwin [1953].

Subarctic circumpolar: Seward Pen., Alaska, to central Keewatin, n. Que., central Lab., and Nfld., s. to Calif., N.M., Neb., Ill., and Va.; southern half of Greenland; Iceland; n. Eurasia. A map of the American distribution, on which the occurrence of the species in Manitoba as far north as York Factory should be indicated, is given by Fassett [Rhodora 53: 169 (fig. 10). 1951].

2. **C. hermaphroditica** L. (*C. autumnalis* L.)

Ponds and shores almost throughout the province except the extreme north. Northernmost collection: Churchill (Porsild, 1930, rocky pool; Beckett, 1950). Earliest collection seen: near Winnipeg, stagnant water (Macoun, 1872). First report: Jackson *et al.* [1922].

Subarctic circumpolar: Seward Pen., Alaska, to nw. Mack., n. Man., s. Lab., and Nfld., s. to Calif., Colo., Neb., Mich., and N.Y.; w. Greenland; n. Eurasia. A map of the American distribution, on which the occurrence of the species in Manitoba as far north as Churchill should be indicated, is given by Fassett [Rhodora 53: 216 (fig. 24). 1951].

*C. heterophylla* Pursh is cited from Pembina River by Lowe [1943]. There is evidently no supporting specimen, however, and it should be excluded from our flora for the present.

## 64. EMPETRACEAE

(Crowberry Family)

### 1. Empetrum L.

1. **E. nigrum** L. (Incl. var. *hermaphroditum* (Lange) Sørensen) Crowberry

The following specimens have been seen: Victoria Beach (Jackson, 1922); Lake Winnipegosis, black spruce woods (Scoggan, 1948; Scoggan & Baldwin, 1950); The Pas (Krivda, 1951); Gillam, about 165 miles south of Churchill (Schofield, 1950); York Factory, black spruce woods (Scoggan, 1949); Churchill (several collections, the earliest seen being one by Macoun in 1910); Nejanilini Lake, lat. 59° 22′ N., gravel ridge (Scoggan & Baldwin, 1950); Reindeer Lake, lat. 57° 49′ N., black spruce woods (Baldwin, 1951); Nueltin Lake, lat. 59° 48′ N., knoll (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barrens and hillocks (Scoggan & Baldwin, 1950). First report: Churchill River [Bell, 1880].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to north-central Ellesmereland), n. Que., n. Lab., and Nfld., s. to n. Calif., s. Alta., n. Minn., n. Mich., and the mts. of N.E.; Greenland; Iceland; Spitsbergen; n. Eurasia. Maps of the greater part of the American distribution are given by Fernald [1925, p. 248] and Raup [1947, pl. XXX].

## 65. ANACARDIACEAE

(Cashew Family)

### 1. Rhus L.

(Sumac. Poison Ivy)

1. Leaves pinnately compound with numerous leaflets, these regularly toothed; inflorescence a terminal pyramid of ascending panicles.
  2. Branches glabrous.......................................1. *R. glabra*
  2. Branches short-pilose or puberulent.......................*R. glabra* var. *borealis*
1. Leaves composed of 3 drooping leaflets, these irregularly lobed; panicles axillary.................................................2. *R. radicans* var. *rydbergii*

1. **R. glabra** L. (Incl. var. *borealis* Britt.) Smooth Sumac

Dry sandy soil in the southern part of the province. Northernmost collection: Lac du Bonnet, about 50 miles northeast of Winnipeg, dry ridge (Halliday, 1933). Earliest collection seen: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1921). First report: Jackson *et al.* [1922].

Temperate American: s. B.C. to sw. Que., s. to Minn., Ind., and N.C.

*R. glabra* var. *borealis* Britt. is accredited to s. Manitoba in the range given by Fernald [1950], but all specimens seen appear referable to the main form.

2. **R. radicans** L. var. **rydbergii** (Small) Rehd. (*R. toxicodendron* L. var. *rydbergii* (Small) Garrett) Poison Ivy

Woods, thickets, sandhills, and clearings in the southern two-fifths of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, limestone substratum (Scoggan, 1948).

Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Lake Winnipeg Valley [Fernald, Rhodora 43: 595. 1941]. Basis of reports of the main form and of *R. toxicodendron* from the province.

Temperate American: B.C. to e. Que., s. to Ariz., Tex., Kans., Ill., Mich., and mts. of w. Va.

## 66. CELASTRACEAE

(Staff-tree Family)

### 1. CELASTRUS L.

1. **C. scandens** L. Climbing Bittersweet

Woods in the southern part of the province. Northernmost collection: Victoria Beach, about 55 miles north-northeast of Winnipeg (Dudley, 1930). Earliest collection seen: Lower Fort Garry, near Selkirk, low woods (Macoun, 1884). First report: Valley of the Assiniboine River east of Brandon [Macoun, 1883].

Temperate eastern American: s. Man. to s. Que., s. to Okla., La., and Ga.

## 67. ACERACEAE

(Maple Family)

### 1. ACER L.

(Maple)

1. Leaves compound, with 3-7(-9) leaflets; wings of fruit strongly ascending.
  2. Branchlets glabrous........................................1. *A. negundo*
  2. Branchlets puberulent........................................*A. negundo* var. *interius*
1. Leaves simple, palmately lobed.
  3. Inflorescence a raceme or wand-like panicle; halves of the samaras usually strongly divergent; tall shrubs or slender trees.
    4. Inflorescence a slender ascending panicle; samaras strongly ribbed over the seeds; leaves 3-lobed and often with a weaker pair of lobes toward base, coarsely serrate........................................2. *A. spicatum*
    4. Inflorescence a drooping raceme; samaras ribless over the seeds; leaves 3-lobed at apex, finely and sharply doubly-serrate........................................*A. pensylvanicum*
  3. Inflorescence various, but neither racemose nor paniculate.
    5. Sinuses of leaves U-shaped; petals none; flowers appearing as the leaf-buds open; wings of samaras nearly parallel above base........................................*A. saccharum*
    5. Sinuses of leaves V-shaped; flowers appearing long before the leaves; wings of samaras usually divergent.
      6. Petals about equalling the sepals; samaras glabrous; leaves rarely cleft more than half-way to base, the terminal lobe broadest at base and scarcely more than half the length of the blade........................................*A. rubrum*
      6. Petals none; samaras usually hairy at base; leaves more deeply cleft, the terminal lobe much narrowed at base and more than half the length of the blade........................................*A. saccharinum*

1. **A. negundo** L. (*Negundo nuttallii* (Nieuwl.) Rydb.; and incl. var. *interius* (Britt.) Sarg. (*Negundo interius* (Britt.) Rydb.))

Woods, thickets, and shores in the southern two-fifths of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, limestone cliffs of Nason Island and Wilkins Point (Scoggan, 1948). Collections from planted specimens have also been made at The Pas (Krivda, 1953, along road) and Cross Lake, northeast of Lake Winnipeg (Scoggan, 1948, planted near Hudson's Bay Co. post). Earliest collection seen: Fort Garry (Schultz, 1860). First report: along the Red River [Hooker, 1830; as *Negundo fraxinifolium*].

Temperate American: Mont. and s. Alta. to s. Ont. and N.E., s. to Ariz., Tex., and Fla.; cultivated and naturalized elsewhere. A map of the area is given by Munns [1938], and one of the northern part of the distribution by the Dominion Forest Service [1949].

2. **A. spicatum** Lam. Mountain-Maple

Woods in the southern two-fifths of the province. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: Duck Bay, Lake Winnipegosis (Macoun, 1881). First report: Lake Winnipeg [Hooker, 1830].

(Subarctic-)temperate eastern American: Sask. to se. Lab. and Nfld., s. to ne. Ia., O., Tenn., and n. Ga. A map of the greater part of the distribution is given by the Dominion Forest Service [1949, p. 242].

*A. pensylvanicum* L., Striped Maple or Moosewood, is cited from Lake Winnipeg by Hooker [1830] and is accredited to Manitoba in the range given by Fernald [1950]. No specimens have been seen, however, nor do the maps of the Dominion Forest Service [1949] and Braun [Rhodora 39: 202 (fig. 28). 1937] indicate its presence in the province, so it seems best to exclude it from our flora for the present.

*A. saccharum* Marsh. (*A. saccharophorum* K. Koch), Sugar-Maple, is accredited to the southeastern corner of the province by Lowe [1943], and the map of the Dominion Forest Service [1949, p. 252] may be interpreted as indicating the possibility of its occurrence there. No specimens have been seen, however, and it may be excluded from our flora for the present. The map of Munns [1938] does not indicate its occurrence in Manitoba.

*A. rubrum* L., Red Maple, is indicated by Lowe [1943] as reaching its western limit in the Ontario-Manitoba boundary area and is accredited to the province in the range given by Fernald [1950]. The map of the Dominion Forest Service [1949, p. 256], however, shows the species as just reaching, without definitely entering, the province. A collection in the Gray Herbarium of Harvard University (Lake Winnipeg Valley, Bourgeau, 1857) is the only one seen and may be the basis of the citation from Rainy Lake, Ont., by J. M. Macoun [1899]. It seems best to exclude the species from our flora for the present. The map of Munns [1938] does not indicate its occurrence in Manitoba.

*A. saccharinum* L., Silver Maple, is planted along streets but is not a native tree.

## 68. BALSAMINACEAE

## (Touch-me-not Family)

### 1. IMPATIENS L.

### (Jewelweed. Touch-me-not)

1. Spur 3-8 mm. long, bent at right angles to the sac, the latter pale yellow, sparingly dotted, broader than long.......................................................*I. pallida*

1. Spur about 1 cm. long, strongly recurved parallel to the sac, the latter longer than broad.
   2. Flowers 15-18 mm. long, orange, normally with crimson spots, the sac at least two-thirds as broad as long, abruptly contracted into the spur.............1. *I. capensis*
   2. Flowers about 2 cm. long, pale yellow, unspotted or with numerous small dots, the sac one-half as broad as long or less, gradually tapering into the spur...2. *I. noli-tangere*

1. **I. capensis** Meerb. (*I. biflora* Walt.; *I. fulva* Nutt.) Spotted Touch-me-not. Jewelweed. Snapweed

Moist woods, thickets, and shores in the southern half of the province. Northernmost collection: Flin Flon, moist ground (Scoggan, 1951). Earliest collection seen: Muskeg Island, Lake Winnipeg (Macoun, 1884). First report: Red River [Bourgeau, in Palliser, 1863].

Subarctic American: n. Alaska to central Alta. and Nfld., s. to s. B.C., Okla., and Fla.

Forma *immaculata* (Weath.) Fern. & Schub., with unspotted flowers, is common throughout the Manitoba area.

2. **I. noli-tangere** L. (*I. occidentalis* Rydb.) [*See* Hultén, 1947].

Known in the province only from limestone cliffs of Wilkins Point, Lake Winnipegosis, where it was collected by the writer in 1948. First report: the present publication.

Subarctic ?circumpolar: central Alaska to Lake Athabasca, s. to Wash. and south-central Man.; gap in eastern North America; Eurasia.

*I. pallida* Nutt., Pale Touch-me-not, is cited from Aweme and Riding Mountain by Lowe [1943]. The Riding Mountain specimen has not been seen, but that from Aweme is referable to *I. capensis* f. *immaculata*. The species should be excluded from our flora for the present.

## 69. RHAMNACEAE

## (Buckthorn Family)

1. Flowers few in axillary clusters, green, lacking petals; fruit fleshy, 3-seeded; plant of moist or shaded habitats.............................................1. *Rhamnus*

1. Flowers numerous in terminal or axillary clusters, white; petals present; fruit dry, 3-lobed; plants of dry sandy places...............................................2. *Ceanothus*

### 1. RHAMNUS L.

### (Buckthorn)

1. Calyx-lobes and stamens 5; petals none; low shrub.......................1. *R. alnifolia*

1. Calyx-lobes, petals, and stamens 4; coarse shrub or small tree, some of the branches usually spine-tipped.......................................................*R. cathartica*

1. **R. alnifolia** L'Hér.

Woods, thickets, and swampy ground in the southern three-quarters of the province. Northernmost collection: Nelson River opposite Gillam Island, about 20 miles west-southwest of York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: Manitoba House, near The Narrows of Lake Manitoba (Macoun, 1881). First report: near York Factory ["H", Richardson, in Franklin, 1823].

(Subarctic-)temperate American: B.C. and n. Alta. to Nfld., s. to Calif., Wyo., Neb., O., and Pa.

*R. cathartica* L., Common Buckthorn, is tentatively cited from Gimli by Groh & Frankton [1949], but the specimen concerned is referable to the above species.

### 2. CEANOTHUS L.

### (Redroot)

1. Leaves of an elliptic type, obtuse to subacute; panicles terminating leafy shoots of the season............................................................1. *C. ovatus*
1. Leaves of an ovate type; panicles terminating axillary peduncles, these scarcely leafy at summit..........................................................*C. americanus*

1. **C. ovatus** Desf.

Specimens have been seen from the following localities: Brokenhead, about 30 miles northeast of Winnipeg, sandy jack-pine woods (Mosquin, 1952; Scoggan & Mosquin, 1953); Sandilands Forest Reserve southeast of Winnipeg, sandy jack-pine woods (Breitung, 1949; Scoggan, 1951); Winnipeg (Denike, 1939). First report: Jackson *et al.* [1922].

Temperate eastern American: s. Man. to w. Que. and w. Me., s. to Tex., Ark., and Ga.

*C. americanus* L., New Jersey Tea, is accredited to Manitoba in the range given by Fernald [1950], probably on the basis of a specimen in the Gray Herbarium of Harvard University bearing the following data: "L. Winipeg Valley, E. Bourgeau, 1859". In view of the fact that no other material has been seen to substantiate the occurrence of the species in Manitoba, and that the above locality was very broadly interpreted by Bourgeau, it seems advisable to exclude it from our flora for the present.

## 70. VITACEAE

### (Vine Family)

1. Leaves digitate, with mostly 5 coarsely toothed leaflets; inflorescence cymose...........................................................................1. *Parthenocissus*
1. Leaves simple, coarsely and sharply toothed, unlobed or 2-lobed near apex, cordate at base; inflorescence paniculate....................................................2. *Vitis*

### 1. PARTHENOCISSUS Planch.

### (Virginia Creeper)

1. Tendrils terminated by adhesive disks; leaflets up to 15 cm. long, dull above; fruits 1-3-seeded..........................................................1. *P. quinquefolia*
1. Tendrils without adhesive disks; leaflets mostly 5-12 cm. long, shining above when fresh; fruits 3-4-seeded.................................................2. *P. inserta*

1. **P. quinquefolia** (L.) Planch. (*Psedera quinquefolia* (L.) Greene)

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg, climbing by adhesive disks on *Fraxinus* (Scoggan, 1953); Grand Beach, near the southeast end of Lake Winnipeg (Breitung, 1949); Rock Lake, about 50 miles southeast of Brandon, climbing by adhesive disks on *Fraxinus* (Scoggan, 1953). First report: Winnipeg and Morden [J. M. Macoun, 1903; as var. *laciniata*].

Temperate eastern American: s. Man. to sw. Que. and Me., s. to Tex., Mex., and Fla.

2. **P. inserta** (Kerner) K. Fritsch (*P. vitacea* (Knerr) Hitchc.; *Psedera vitacea* (Knerr) Greene)

Thickets and woods of southern Manitoba. Northernmost collection: Hecla Island, Lake Winnipeg, limestone cliffs (Scoggan, 1951). Earliest collection seen: Winnipeg, thickets (Macoun, 1896). First report: Red River valley [Jackson *et al.*, 1922].

Temperate American: Mont. to s. Man. and Que., s. to Calif., N.M., Kans., and Pa.

### 2. Vitis L.

### (Grape)

1. **V. riparia** Michx. (*V. vulpina* of auth., not L.) River-bank-Grape

Thickets and woods of southern Manitoba. Northernmost collection: Victoria Beach, about 55 miles north-northeast of Winnipeg (Marquardt, 1930). Earliest collection seen: Winnipeg, thickets (Macoun, 1896). First report: "Extending to the south end of Lake Winnipeg" [Hooker, 1830]. Basis of reports of *V. palmata* Vahl and *V. vulpina* L. (*V. cordifolia* Michx.) from the province.

Temperate American: Mont. and s. Man. to Que., s. to N.M., Tex., Mo., Tenn., and Va.

## 71. TILIACEAE

## (Linden Family)

### 1. Tilia L.

1. **T. americana** L. (*T. glabra* Vent; *T. neglecta* Spach) [*See* Fernald, Rhodora 39: 606-607. 1941] Basswood

Rich woods of southern Manitoba. Northernmost collection: Portage la Prairie (Scoggan, 1953). Earliest collection seen: Winnipeg, thickets (Macoun, 1896). First report: Norway House [Hooker, 1830]; the specimen has not been seen but, if correctly determined, was doubtless taken from a planted tree.

Temperate eastern American: s. Man. to s. Que., s. to Tex., Ark., Tenn., Ala., and Del. A map of the distribution is given by Munns [1938], and one of the northern part of the distribution by the Dominion Forest Service [1949].

## 72. MALVACEAE

### (Mallow Family)

1. Leaves simple; column of stamens anther-bearing only at top; stigmas occupying the inner face of the styles.......................................................1. *Malva*
1. Leaves deeply 3-5-parted; stigmas terminal, capitate.
   2. Corolla pale yellow with a purplish-black eye, the edges of the petals purple-tinged; fruiting calyx inflated and with a striking pattern of dark ciliate nerves; column of stamens anther-bearing for a considerable part of its length; plant rather hairy...... ..............................................................2. *Hibiscus*
   2. Corolla coppery-scarlet or brick-red; fruiting calyx not inflated; column of stamens anther-bearing only at top; plant hoary with a dense silvery stellate pubescence..... ..............................................................3. *Sphaeralcea*

### 1. MALVA L.

### (Mallow)

1. Petals twice as long as the calyx; carpels round-margined; leaves prominently 5-7-lobed, their margins crisped..................................1. *M. verticillata* var. *crispa*
1. Petals about equalling the calyx; carpels acute-margined; leaves obscurely lobed...... ..............................................................2. *M. rotundifolia*

1. M. VERTICILLATA L. var. CRISPA L. Curled Mallow

Known in the province only from Dauphin, north of Riding Mountain, where it was collected by G. Batho in 1938. First report: Dauphin [Groh & Frankton, 1949].

European: naturalized in North America.

2. M. ROTUNDIFOLIA L.

Gardens, roadsides, and waste places of southern Manitoba. Northernmost collection: Dauphin, north of Riding Mountain, thicket (Scoggan, 1951). Earliest collection seen: Morden, about 60 miles southwest of Winnipeg, clearing (Macoun, 1896). First report: Burman [1910]. Basis of citations of *M. neglecta* Wallr. from Winnipeg and LaSalle by Groh & Frankton [1949].

European: naturalized in North America.

### 2. HIBISCUS L.

### (Rose-Mallow)

1. H. TRIONUM L. Flower-of-an-hour

Specimens have been seen from the following localities: Fort Garry (Schultz, 1861); Morden, about 60 miles southwest of Winnipeg, garden escape (Scoggan, 1953); Portage la Prairie (McMorine, 1896); Miami, about 40 miles south of Portage la Prairie (Seip, 1931); Brandon (Stevenson, 1953); Lyleton, about 80 miles southwest of Brandon (Richardson, 1931); Berens River, about 170 miles north of Winnipeg (Scoggan, 1948); Grand Rapids, off the northwest end of Lake Winnipeg (Jackson, 1925). Cultivated and escaped from gardens. First report: Grand Rapids, Lyleton, Miami, and Winnipeg [Lowe, 1943].

European: naturalized in North America.

### 3. SPHAERALCEA St. Hil.

1. **S. coccinea** (Pursh) Rydb. (*Malvastrum coccineum* (Pursh) Gray) Scarlet Mallow

Sandy or clayey prairie of southern Manitoba. Northernmost collection: Dropmore, about 100 miles northeast of Brandon, dry prairie roadside (Scoggan, 1951). Earliest collection seen: Long (Pembina) River, Man., dry open prairie (Burgess, 1873). First report: Long River [Dawson, 1875].

Temperate western American: s. B.C. to s. Man., s. to Oreg., Utah, Tex., and Ia.

## 73. GUTTIFERAE

### (St. John's-wort Family)

### 1. HYPERICUM L.

### (St. John's-wort)

1. Petals pinkish to purplish; stamens mostly 9, in 3 groups alternating with 3 large orange glands; flowers in axillary and terminal clusters..........1. *H. virginicum* var. *fraseri*
1. Petals yellow; stamens numerous or few, without intervening glands; flowers terminal or in terminal cymes.
    2. Petals 2-3 cm. long; styles 5; capsule 5-celled; stamens very numerous, in 5 clusters ..........H. *pyramidatum*
    2. Petals rarely more than 1 cm. long; styles 3; capsule 1-3-celled.
        3. Stamens very numerous, in 3-5 clusters.
            4. Capsule 1-celled; seeds minutely striate; petals bright yellow; sepals oblong; cyme nearly naked, rather few-flowered; slender-stoloniferous..........*H. ellipticum*
            4. Capsule 3-celled; seeds coarsely reticulate; petals orange-yellow; sepals linear-lanceolate, attenuate; cyme leafy, its flowers very numerous; stems producing leafy basal offshoots..........*H. perforatum*
        3. Stamens 5-20, not obviously clustered; capsules 1-celled.
            5. Leaves ovate to narrowly oblong; petals 1·5-2 mm. long; sepals broadest near the middle; capsules ellipsoid, rounded to the summit..........*H. mutilum*
            5. Leaves linear to lanceolate; petals 2·5-6·5 mm. long; sepals broadest well below the middle; capsules conic.
                6. Leaves linear to linear-oblanceolate, 1-3-nerved; sepals 2·5-4·5 mm. long..........2. *H. canadense*
                6. Leaves (at least the upper) lanceolate, 5-7-nerved at base; sepals 4-7 mm. long..........3. *H. majus*

1. **H. virginicum** L. var. **fraseri** (Spach) Fern. (*Triadenum fraseri* (Spach) Gleason) Marsh-St. John's-wort

Specimens have been seen from the following localities: Sundown, about 60 miles southeast of Winnipeg, swampy ground (Scoggan, 1953); Shoal Lake, on the Ontario boundary east of Winnipeg (Lowe, 1920; Scott, 1925); Cross Lake, near the Ontario boundary northeast of Winnipeg (Simpson, undated); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, rocky shore (Breitung, 1949). First report (with citation of localities): the present publication; but Manitoba is included in the range given by Fernald [1950]. Basis of reports of the main form from the province.

(Subarctic-)temperate eastern American: Man. to s. Lab. and Nfld., s. to Neb., Minn., Ind., and Pa.

2. **H. canadense** L.

A specimen has been seen only from Whitemouth, about 50 miles east of Winnipeg, where it was collected by J. Feller in 1923. Reported also from Brereton and Stony Mountain by Lowe [1943]. First report: Lake Winnipeg [Hooker, 1830].

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to Ia., Ill., Ala., and Ga.

3. **H. majus** (Gray) Britt. (*H. canadense* var. *majus* Gray)

Specimens have been seen from the following localities: Caddy Lake, near the Ontario boundary east of Winnipeg (Leach, 1939); Brokenhead, about 30 miles northeast of Winnipeg (Mosquin, 1952); Black River, near the southeast end of Lake Winnipeg, low ground (Macoun, 1884); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, rocky shore (Breitung, 1949). First report: Jackson *et al.* [1922].

Temperate American: s. B.C. to Que. and N.B., s. to Wash., Colo., Neb., and Pa.

*H. pyramidatum* Ait. (*H. ascyron* of Am. auth., not L.), Great St. John's-wort, is accredited to Manitoba in the range given by Fernald [1950], presumably on the basis of a collection in 1859 by Bourgeau in what he broadly referred to as the Lake Winnipeg valley. In view of the facts that no later collections have been made and that the Bourgeau collection probably originated outside of the present limits of the province, it seems advisable to exclude this species from our flora. The same collection is probably the basis of reports of *H. ascyron* from the province by Burman [1910], Jackson *et al.* [1922], and Lowe [1943].

*H. ellipticum* Hook. is cited from Lake Winnipeg by Hooker [1830], the probable basis of later reports of the species from the province. No specimens have been seen, however, and it should be excluded from our flora for the present.

*H. perforatum* L., Common St. John's-wort, is cited from Winnipeg by Lowe [1943], but supporting specimens appear to be lacking, and it should be excluded from our flora for the present.

*H. mutilum* L. is cited from the province by Macoun [1883], Burman [1910], Jackson *et al.* [1922], and Lowe [1943], but no specimens have been seen, and it should be excluded from our flora for the present. Probable basis of the citation of *H. quinquenervium* from "Canada, to Lake Winnipeg" by Hooker [1830].

## 74. CISTACEAE

### (Rockrose Family)

1. Leaves scale-like, appressed and overlapping; flowers yellow, terminating short branches; style long; plants bushy and heath-like.................................1. *Hudsonia*
1. Leaves not scale-like; style short or none; plants not bushy.
    2. Petals 3, reddish, mostly shorter than the sepals; flowers very small; leaves green; base of plant usually with leafy offsets.................................2. *Lechea*
    2. Petals 5, yellow, exceeding the sepals; flowers relatively large; leaves pale-tomentose beneath; base of plant without leafy offsets......................3. *Helianthemum*

### 1. HUDSONIA L.

1. **H. tomentosa** Nutt. Beach-heath. False Heather

Specimens have been seen from the following localities: Lake Winnipeg (McTavish; undated, but probably 1853–54); Victoria Beach, about 55 miles north-northeast of Winnipeg (Jackson, undated; Lowe, 1933, dry sandy soil; Groh, 1945, sandy plain; Sparling, 1950, sandy soil); Sandilands Forest Reserve, southeast of Winnipeg (Halliday, 1935); Brokenhead, about 30 miles northeast of Winnipeg (A. & D. Löve, 1952, sandhills; Scoggan & Mosquin, 1953, sandy jack-pine woods). First report: north end of Lake Winnipeg [Bell, 1880]; this northern citation requires verification.

(Subarctic-)temperate American: n. Alta. to e. Que., s. to Sask., Minn., Ind., s. Ont., Me., and N.C.

### 2. LECHEA L.

### (Pinweed)

1. Outer sepals notably shorter than the inner ones.
   2. Seeds 4-6, shaped like a section of orange, with a pale, thin, adherent membrane.......................................................... 1. *L. intermedia*
   2. Seeds 3 or 4, 2-sided or obscurely 3-sided, smooth......................*L. stricta*
1. Outer sepals about as long as the inner or exceeding them; seeds 2 or 3, 2-sided or obscurely 3-sided..................................................*L. minor*

1. **L. intermedia** Leggett

Specimens have been seen from the following localities: Brokenhead, about 30 miles northeast of Winnipeg (Mosquin, 1952; Scoggan & Mosquin, 1953, sandy jack-pine woods); Victoria Beach, about 55 miles north-northeast of Winnipeg, sandy pine woods (Breitung, 1949); Treesbank, about 20 miles southeast of Brandon, sandy plain (Fyles, 1914). First report: Lake Winnipeg [Macoun, 1883, under *L. minor*, but, according to J. M. Macoun, 1898, referable to the present species]. Basis of reports of *L. stricta* Leggett from the province by Jackson *et al.* [1922] and Lowe [1943].

Temperate eastern American: s. Man. to P.E.I., s. to Neb., Wisc., Mich., s. Ont., and N.Y. A map of the distribution, on which the occurrence of the species in southern Manitoba should be indicated, is given by Hodgdon [Rhodora 40: 120 (map 25). 1938].

### 3. HELIANTHEMUM Mill.

1. **H. bicknellii** Fern. (*H. majus* and *Crocanthemum majus* of auth., not *H. major* L.) Frostweed

Specimens have been seen from the following localities: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1920); Sandilands Forest Reserve, east of Winnipeg, sandy pine woods (Breitung, 1949); Stony Mountain, near Winnipeg (Marquardt, 1932); Brokenhead, about 30 miles northeast of Winnipeg (Mosquin, 1952, open sandy soil; Scoggan & Mosquin, 1953, sandy jack-pine woods); Victoria Beach, about 55 miles north-northeast of Winnipeg (Broderick, 1925; Simpson, 1937; Groh, 1945; Breitung, 1949, sandy pine woods); "Manitoba" (Fletcher, 1896). First report: Carberry [Christy, 1887]. Basis of reports of *H. canadense* (L.) Michx. from the province.

Temperate eastern American: Man. to Me., s. to Colo., Kans., O., and N.C.

## 75. VIOLACEAE

### (Violet Family)

### 1. VIOLA L.

### (Violet)

[*See* Baird, 1942.]

1. Plants stemless, the leaves and scapes arising directly from rootstocks or runners.

2. Flowers violet or lilac-purple.

3. Leaves divided to base into erect segments, truncate to cuneate at base; lateral petals bearded; plant of prairie habitats..........................1. *V. pedatifida*

3. Leaves merely shallowly toothed, not divided.

4. Rhizome thick and fleshy, short; flowers violet.

5. Sepals non-ciliate; spurred petal bearded toward base; petioles and peduncles essentially glabrous; leaves glabrous in age, cordate-ovate to reniform, their teeth broadly flattened..................................2. *V. nephrophylla*

5. Sepals finely ciliate; spurred petal essentially glabrous; petioles and lower surface of expanding cordate-ovate leaves densely long-hairy; leaves prominently toothed..................................................3. *V. sororia*

4. Rhizome slender and elongate.

6. Flowers pale violet; spur 5-8 mm. long, up to two-thirds the length of the blade; petals all beardless; leaves strigose above, the basal lobes converging or overlapping..................................................4. *V. selkirkii*

6. Flowers pale lilac; spur about 2 mm. long; lateral petals slightly bearded; leaves glabrous, with open sinus.............................5. *V. palustris*

2. Flowers white with purple lines.

7. Leaves ovate-cordate or round-cordate, generally rather pointed and dull; lateral petals beardless; plants stoloniferous.

8. Leaves entirely glabrous, obtuse, generally small, usually much exceeded by the scapes; upper petals broadly obovate..........................6. *V. pallens*

8. Leaves with a few scattered hairs on the upper surface, acutish, rarely exceeded by the scapes; petioles and base of scapes usually reddish; upper petals narrow and strongly reflexed..........................................7. *V. blanda*

7. Leaves orbicular-reniform, generally pointless and waxy-glossy; petals all beardless; plant non-stoloniferous.

9. Plant pubescent throughout..................................8. *V. renifolia*

9. Plant glabrous or essentially so....................*V. renifolia* var. *brainerdii*

1. Plants with elongate leafy stems, the flowers axillary.

10. Leaves lanceolate or narrowly ovate-lanceolate, tapering gradually into margined petioles; stipules subentire; flowers yellow, with a short spur; plant of prairie habitats..................................................9. *V. nuttallii*

10. Leaves cordate-ovate to reniform-ovate (those of No. 14 often subcordate or somewhat decurrent at base); lateral petals bearded.

11. Flowers yellow or white, with purple lines; style clavate, beakless; spur short; stipules subentire.

12. Flowers white, often violet-tinged on back; stipules thin and scarious, pale, narrowly lanceolate, with slender tips; leaves abruptly pointed; plant with elongate cord-like rootstocks.............................10. *V. rugulosa*

12. Flowers yellow; stipules herbaceous, broader.

13. Plant densely pubescent; leaves heavy, strongly veined, the basal ones usually wanting; stipules broadly ovate...............11. *V. pubescens*

13. Plant sparingly pubescent or glabrate; leaves thinner, less veiny; basal leaves commonly 1-3; stipules lanceolate or narrowly ovate...............
.................................12. *V. pensylvanica* var. *leiocarpa*

11. Flowers violet; style slender, bent at tip; spur at least twice as long as thick; stipules toothed, at least at base.

14. Leaves rather thin, essentially glabrous, the upper ones reniform-ovate, with rounded or abrupt blunt tips; stipules ovate-lanceolate, with teeth up to 2 mm. long; flowers pale violet........................13. *V. conspersa*

14. Leaves firm, the upper ones ovate, gradually narrowed to apex; stipules linear-lanceolate, with shorter teeth; flowers deep violet or violet-blue.
    15. Leaves densely puberulent..............................14. *V. adunca*
    15. Leaves essentially glabrous..................14a. *V. adunca* var. *minor*

1. **V. pedatifida** G. Don Larkspur Violet. Purple Prairie Violet

Dry or moist prairie in the southern half of the province. Northernmost collection: Stony Mountain, near Winnipeg, dry stony soil (Sparling, 1951). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Jackson *et al.* [1922; as *V. "pedatifolia"*]. Basis of reports of the probably identical *V. delphinifolia* from the province by Burman [1910], and of *V. pedata* L. (Pansy-Violet; petals all beardless) by Dawson [1875], Macoun [1883], Jackson *et al.* [1922], and Lowe [1943].

Temperate American: Alta. to s. Man. and n. O., s. to Ariz., N.M., Okla., and Mo.

2. **V. nephrophylla** Greene

Meadows, swampy ground, and shores in the southern three-quarters of the province. Northernmost collection: Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915). Earliest collection seen: Portage la Prairie, "wet meadows or borders of brooks in woods" (Macoun, 1879). First report: Warren Landing [Lowe, 1920].

Subarctic American: Great Bear L. to n. Man., s. James Bay, and Nfld., s. to s. Calif., N.M., N.D., n. Ia., Mich., and N.E.

3. **V. sororia** Willd.

Meadows and woods of southern Manitoba. Northernmost collection: Fork River, about 115 miles north of Brandon (Jackson, 1922). Earliest collection seen: Winnipeg, damp grassy places (Macoun, 1896). First report: Aweme, about 20 miles southeast of Brandon [Criddle, 1927]. Basis of citations of *V. septentrionalis* Greene from Roseisle and Victoria Beach and of *V. cucullata* Ait. from McCreary, Morden, and Winnipeg by Lowe [1943]. Probable basis of the citation of the latter from Dufferin and Pembina Mountain by Dawson [1875]. Its report by Bell [1880] from Nelson River between Lake Winnipeg and the coast of Hudson Bay cannot be interpreted in the absence of the specimen concerned.

Temperate eastern American: s. Man. to sw. Que., s. to Okla., Ky., and N.C.

4. **V. selkirkii** Pursh

Specimens have been seen from the following localities: Riding Mountain, damp woods (Rowe, 1948, 1950); The Pas, shaded woods (Krivda, 1950). First report: the present publication.

Subarctic circumpolar: south-central Alaska and central Yukon to south-central Man., s. Lab., and Nfld., s. to s. B.C., Colo., Minn., and Pa.; s. Greenland; n. Eurasia.

5. **V. palustris** L. Alpine Marsh-Violet

Specimens have been seen from the following localities: Riding Mountain, woods near swamp (Rowe, 1948); Norway House, off the northeast end of Lake Winnipeg, open ground (Scoggan, 1948); Gillam, about 165 miles south of Churchill (Schofield, 1950); Reindeer Lake, lat. 57° 37′ N., spruce woods (Baldwin, 1951); Nejanilini Lake, lat. 59° 22′ N., isolated stand of low black spruce and tamarack (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 43′ N., silted lake shore and wet black spruce woods (Baldwin, 1951). First report: Oxford House to Knee Lake [Bell, 1881].

Subarctic circumpolar: B.C., ne. Alta., and s. Keewatin to central Lab. and Nfld., s. to Oreg., Utah, Colo., and mts. of N.H. and Me.; s. Greenland; Iceland; n. Eurasia.

6. **V. pallens** (Banks) Brainerd

Thickets, damp woods, and open ground throughout the province except the extreme north. Northernmost collection: Churchill, sand dune under willows (Dore, 1949). Earliest collection seen: Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915). First report: Waugh, near the Ontario boundary east of Winnipeg [Jackson *et al.*, 1922].

(Arctic-)subarctic American: Great Bear L. to central Keewatin, n. Lab., and Nfld., s. to Mont., N.D., O., Ala., and S.C.

7. **V. blanda** Willd.

Specimens have been seen from the following localities: Sanford, about 15 miles southwest of Winnipeg (no data); Birds Hill, near Winnipeg, bog (Denike, 1939); Aweme, about 20 miles southeast of Brandon (Criddle, 1926); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, moist spruce woods (Breitung, 1949); Berens River, Lake Winnipeg, about 160 miles north of Winnipeg, mossy woods (Macoun, 1886); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, open ground (Scoggan, 1949); Hayes River, about 110 miles southwest of York Factory, gravel shore (Scoggan, 1949). First report: vicinity of Lake Winnipeg [Hooker, 1830; as *V. clandestina*].

(Subarctic-)temperate eastern American: n. Man. to sw. Que., s. to Ill., O., Tenn., and Ga.

8. **V. renifolia** Gray (Incl. var. *brainerdii* (Greene) Fern.) [*See* Boivin, Can. Field-Nat. 65: 22. 1951.]

Damp woods and swampy ground in the southern three-quarters of the province. Northernmost collection: Herchmer, about 100 miles south of Churchill (Taverner, 1936). Earliest collection seen: Kenville, north of Duck Mountain (collector unnamed; 1932). First report: Jackson *et al.* [1922].

Subarctic American: sw. Alaska and Great Bear L. to n. Man., James Bay, s. Lab., and Nfld., s. to s. B.C., Colo., S.D., Minn., Ont., and N.E.

9. **V. nuttallii** Pursh

Dry prairie of southern Manitoba. Northernmost collection: Brandon, clay soil (Macoun, 1896). Earliest collection seen: "East Crossing Souris River", west of Turtle Mountain, dry hills (Burgess, 1874). First report: "Plains west of Turtle Mountain" [Dawson, 1875].

Temperate western American: s. Sask. and s. Man., s. to Mont., Ariz., and Mo.

10. **V. rugulosa** Greene

Thickets, woods, and clearings in the southern half of the province. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: Stonewall, near Winnipeg, open thickets (Macoun, 1896). First report: Kenville [Lowe, 1943]. Basis of reports of the non-stoloniferous *V. canadensis* L. from the province.

(Subarctic-)temperate western American: Mack. to n. Alta. and central Man., s. to Ariz., N.M., and Ia.

11. **V. pubescens** Ait. Downy Yellow Violet

Thickets and woods of southern Manitoba. Northernmost collection: Fork River, about 115 miles north of Brandon (Jackson, 1922). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, thickets (Burgess, 1873). First report: Dufferin [Dawson, 1875].

Temperate eastern American: s. Man. to sw. Que., s. to Neb., Mo., Tenn., and Va.

12. **V. pensylvanica** Michx. var. **leiocarpa** (Fern. & Wieg.) Fern.

Specimens have been seen from the following localities: Winnipeg (Groh, 1922); Birds Hill, near Winnipeg (Bird, 1950); Selkirk, about 20 miles northeast of Winnipeg, elm woods (Scoggan, 1953); Morden, about 60 miles southwest of Winnipeg, moist shady ground (Marshall, 1940); Turtle Mountain (Bird, 1949); Riding Mountain, edge of stream (Rowe, 1950). First report (with citation of localities): the present publication; but accredited to Manitoba in the range given by Fernald [1950]. Basis of reports of the main form from the province by Lowe [1943; as *V. eriocarpa* Schwein.].

Temperate eastern American: s. Man. to e. Que., s. to Okla., O., Tenn., and N.C.

13. **V. conspersa** Reichenb.

Meadows and damp woods of southern Manitoba. Northernmost collection: Victoria Beach, about 55 miles north-northeast of Winnipeg (Simpson, 1934). Earliest collection seen: Dufferin, near Carman, about

45 miles southwest of Winnipeg (Burgess, 1873). First reports: Spruce Woods Forest Reserve, east of Brandon [Bird, 1927]; Aweme, about 20 miles southeast of Brandon [Criddle, 1927].

Temperate eastern American: s. Man. to e. Que., s. to Tenn., Ala., and Ga.

14. **V. adunca** Sm. (*V. subvestita* Greene)

Dry woods, rock outcrops, shores, and clearings in the southern half of the province. Northernmost collection: Flin Flon, rock outcrop (Scoggan, 1951). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873). First report: Burman [1910; as *V. canina* var. *adunca*].

Subarctic American: sw. Alaska to Great Bear L. and n. Que., s. to Calif., Colo., S.D., Mich., and N.E.

14a. **V. adunca** var. **minor** (Hook.) Fern. (var. *glabra* Brainerd; *V. labradorica* Schrank)

Specimens have been seen from the following localities: Whiteshell Forest Reserve, east of Winnipeg, rock outcrops (Scoggan, 1951); St. Lazare, about 75 miles northwest of Brandon, sandy and gravelly soil (Scoggan, 1951); Norway House, off the northeast end of Lake Winnipeg, damp woods (Scoggan, 1949); gravelly bank of stream about 28 miles south of Churchill (Hughes, 1949). First report: the present publication.

(Arctic-)subarctic American: Great Bear L. to n. Man., n. Lab., and Nfld., s. to Calif., Colo., N.D., Wisc., and N.E.; sw. Greenland.

## 76. LOASACEAE

### (Loasa Family)

### 1. MENTZELIA L.

1. **M. decapetala** (Pursh) Urban & Gilg (*Nuttallia decapetala* (Pursh) Greene) Stickleaf

The following is the only specimen seen: Boissevain (E. Brown; undated specimen in herbarium of University of Manitoba). First report: Boissevain [Jackson *et al.*, 1922].

Temperate western American: Alta. to s. Man., s. to Nev., Tex., and Okla.

## 77. CACTACEAE

### (Cactus Family)

1. Stems jointed, the large yellow flowers borne along the margins of the newer segments ............................................................ 1. *Opuntia*
1. Stems a single globose or ovoid body covered with spine-bearing tubercles, the large purple flowers borne from between the tubercles.................... 2. *Mamillaria*

### 1. Opuntia Mill.

### (Prickly Pear)

1. Joints little flattened, ovoid or subglobose, 1·5-5 cm. long, the terminal one easily separating........................................................1. *O. fragilis*
1. Joints flattened, much broader than thick, broadly obovate or orbicular, 5-15 cm. long ........................................................2. *O. polyacantha*

1. **O. fragilis** (Nutt.) Haw.

Specimens have been seen from the following localities: Falcon Lake, Whiteshell Forest Reserve east of Winnipeg, dry granite shore (Scoggan, 1951); Spruce Woods Forest Reserve southeast of Brandon, dry sandy prairie (Malaher, 1936). First report: Waugh, near the Ontario boundary east of Winnipeg [Jackson *et al.*, 1922].

Temperate western American: B.C. to w. Ont., s. to Ariz., Tex., Kans., Ia., and Ill.

2. **O. polyacantha** Haw. (*O. missouriensis* DC.)

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg, alkaline prairie (Scoggan, 1953); Oak Lake, about 40 miles west of Brandon, dry prairie slope (Scoggan, 1953); Miniota, about 50 miles west-northwest of Brandon, dry alkaline prairie (Scoggan, 1953); Aweme, about 20 miles southeast of Brandon (Fletcher, 1904); Lauder, about 40 miles southwest of Brandon, prairie sandhills (Scoggan, 1951); St. Lazare, about 75 miles northwest of Brandon, sandhills (Scoggan, 1951); Millwood, about 85 miles northwest of Brandon, dry prairie slope (Scoggan, 1953). First report: "The Qu'Appelle valley, about two miles from its mouth, and the north bank of the Assiniboine above Shell River" [Macoun, 1883].

Temperate western American: s. B.C. to s. Man., s. to Utah, N.M., and Mo.

### 2. Mamillaria Haw.

1. **M. vivipara** (Nutt.) Haw. (*Neomamillaria vivipara* (Nutt.) Britt. & Rose)

Specimens have been seen from the following localities: Lauder, about 40 miles southwest of Brandon, sandhills (Scoggan, 1953); Grande Clarière, near Hartney, about 40 miles southwest of Brandon, prairie sandhills (Scoggan, 1950); Oak Lake, about 40 miles west of Brandon, prairie sandhills (Scoggan, 1951). Reported also from Virden by Lowe [1943] and Spruce Woods Forest Reserve by Bird [1927]. First report: Burman [1910].

Temperate western American: Alta. to s. Man., s. to Colo., Kans., and w. Minn.

*M. missouriensis* Sweet (*Neomamillaria missouriensis* (Sweet) Britt. & Rose), with greenish-yellow flowers, is accredited to Manitoba by Rydberg [1932], but no specimens have been seen. Lowe [1943] is of the opinion that the foregoing species is the one involved.

## 78. ELAEAGNACEAE

### (Oleaster Family)

1. Leaves alternate, undulate, densely silvery-scurfy on both sides; fruit silvery, dry and mealy . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *Elaeagnus*
1. Leaves opposite, flat; fruit fleshy . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *Shepherdia*

### 1. ELAEAGNUS L.

1. **E. commutata** Bernh. (*E. argentea* Pursh, not Moench) Silverberry. Wolf Willow

Prairie, gravel ridges, and shores in the southern three-quarters of the province. Northernmost collection: Nelson River opposite Gillam Island, about 20 miles west-southwest of York Factory, gravel shore (Scoggan, 1949). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, thickets (Burgess, 1873). First report: "North end of Lake Winnipeg" and "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

Subarctic American: central Alaska and nw. Mack. to n. Man., James Bay, and e. Que., s. to Utah, S.D., Minn., and sw. Que.

### 2. SHEPHERDIA Nutt.

1. Leaves elliptical or ovate, green above, scurfy with rusty scales beneath; fruit yellowish-red . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *S. canadensis*
1. Leaves cuneate-oblong, silvery on both sides; fruit scarlet; plant somewhat thorny . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *S. argentea*

1. **S. canadensis** (L.) Nutt. (*Lepargyrea canadensis* (L.) Greene) Soapberry

Thickets, woods, rock outcrops, and shores throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Macoun in 1910). Earliest collection seen: York Factory, thickets (Bell, 1879). First report: near York Factory ["H", Richardson, in Franklin, 1823; as *Hippophae canadensis* Willd.].

Subarctic American: n. Alaska, Yukon, and Mack. R. Delta to n. Man. and Nfld., s. to N.M., S.D., n. Minn., O., and N.E. A map of the greater part of the distribution is given by Raup. [1947, pl. XXX].

2. **S. argentea** Nutt. (*Lepargyrea argentea* (Nutt.) Greene) Buffalo-berry

Specimens have been seen from the following localities: Lac du Bonnet, about 50 miles northeast of Winnipeg (Breitung, 1949, river-bank; Scoggan, 1953, thicket by lake); Morden, about 60 miles southwest of Winnipeg, exposure of Benton shale southwest of town (Scoggan, 1951; a single individual, 15 feet high); Portage la Prairie (McMorine, 1897); Treherne, about 30 miles southwest of Portage la Prairie, river-bank (Simpson, 1941); Stockton, about 25 miles southeast of Brandon, prairie slope (Scoggan, 1953); Wawanesa, about 20 miles southeast of Brandon, denuded prairie crest above Souris River (Scoggan, 1953); Lauder, about 40 miles southwest of Brandon, prairie roadside (Scoggan, 1953); Oak Lake, about 40 miles west of Brandon, prairie slope above Assiniboine River (Scoggan, 1953). First report: "Manitoba House, Lake Manitoba" and "clay banks of the Assiniboine above the mouth of the Souris" [Macoun, 1886].

Temperate western American: Alta. to Man., s. to N.M., Kans., and Ia.

## 79. LYTHRACEAE

## (Loosestrife Family)

### 1. Lythrum L.

1. L. salicaria L. Spiked Loosestrife

Specimens have been seen from the following localities: Fort Garry, damp ground (Scoggan, 1951); Lockport, about 10 miles northeast of Winnipeg (Lawrence, 1944); Neepawa, about 35 miles northeast of Brandon (Fletcher, 1896). First report: Neepawa [Groh, 1944].

European; naturalized in North America.

## 80. ONAGRACEAE

## (Evening-Primrose Family)

1. Sepals, petals, and stamens each 2; fruit pear-shaped, bristly with hooked hairs, not splitting at maturity; leaves flaccid, ovate, mostly subcordate at base, long-petioled........................................................................1. *Circaea*
1. Sepals and petals 4; stamens 8; leaves mostly narrower and sessile or short-petioled.
    2. Fruit 1-4-seeded, not splitting at maturity, 4-angled, 5-7 mm. long; flowers red, turning scarlet; stems several, the leaves mostly less than 2 cm. long; plant of dry prairie..............................................................2. *Gaura*
    2. Fruit many-seeded, splitting when ripe, mostly longer; stems mostly solitary, the leaves mostly longer.
        3. Capsule slender, its separated valves recurving; seeds with a tuft of silky hairs at summit; petals white, pink, or purple; lower leaves often opposite....3. *Epilobium*
        3. Capsule mostly stout, its separated valves not recurving; seeds naked; petals mostly yellow, sometimes white; leaves alternate....................4. *Oenothera*

### 1. Circaea L.

### (Enchanter's Nightshade)

1. **C. alpina L.**

Specimens have been seen from the following localities: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1921); Brokenhead, about 30 miles northeast of Winnipeg (Mosquin, 1952); Sandy Hook, about 40 miles north of Winnipeg (Dudley, 1929); Gimli, about 45 miles north of Winnipeg (Jackson, 1923); Camp Morton, about 50 miles north of Winnipeg (A. & D. Löve, 1952); Victoria Beach, about 55 miles north-northeast of Winnipeg (Simpson, 1937); Grassy Narrows, Lake Winnipeg, between Hecla Island and the mainland (A. & D. Löve, 1952); Hecla Island, Lake Winnipeg, white spruce woods (Scoggan, 1951); Doghead Point, at

The Narrows, Lake Winnipeg (Macoun, 1884); Brandon, wet woods (Marshall, 1949); Swan River, north of Duck Mountain (Groh, 1922); Nason Island, Lake Winnipegosis, limestone detritus (Scoggan, 1948); Clearwater Lake, 25 miles northwest of The Pas (Krivda, 1949); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, white spruce woods (Scoggan, 1949). Also reported from Rossburn and Riding Mountain by Lowe [1943]. First report: Burman [1910].

Subarctic circumpolar: central Alaska to central Man., s. Lab., and Nfld., s. to Wash., Utah, Colo., S.D., Mich., Tenn., and Ga.; Eurasia.

*C. quadrisulcata* (Maxim.) Franch. & Sav. (*C. lutetiana* of Am. auth., not L.) is reported from the Ontario boundary by Lowe [1943], but no Manitoba specimens have been seen, and it should be excluded from our flora for the present.

### 2. GAURA L.

### (Gaura)

1. **G. coccinea** Pursh

Dry prairie and roadsides of southern Manitoba. Northernmost collection: Millwood, about 85 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Garry, plains (Macoun, 1872). First report: Red River [Hooker, 1834].

Temperate western American: Alta. to s. Man., s. to Calif., Tex., and Mo.

### 3. EPILOBIUM L.

### (Willow-herb)

1. Petals 1-3 cm. long, pink to purple (rarely white), entire, the corolla slightly irregular; flowers racemose.
   2. Stems erect, usually solitary; leaves rather thin, green above, pale and reticulate-veiny beneath; style longer than stamens.
      3. Principal leaves up to 2 dm. long; mature raceme 1·7-7·5 dm. long; petals 1·3-2 cm. long; plant up to 2 m. high.................................1. *E. angustifolium*
      3. Principal leaves 3-7 cm. long; mature raceme 4-13 cm. long; petals 1-1·5 cm. long; plant 1-5 dm. high, of the Hudson Bay region...*E. angustifolium* var. *intermedium*
   2. Stems depressed and densely matted, upwardly arching; leaves thick and fleshy, whitish or strongly glaucous, not veiny; style declined, much shorter than the stamens ........................................................2. *E. latifolium*
1. Petals less than 1 cm. long, whitish, pink, or violet, notched at apex, the corolla regular; flowers chiefly paniculate.
   4. Annual with cortex at base of stem cracking and exfoliating; usually very slenderly paniculate-branched; stigma often 4-lobed; seeds beakless, their comas early deciduous ........................................................3. *E. paniculatum*
   4. Perennials (or biennials) with close cortex; stigma entire or but shallowly notched; seeds often tapering above to a collar or short beak, their comas more persistent.
      5. Stem with decurrent lines running down from the leaf-bases; principal leaves more or less toothed, not revolute-margined.
         6. Stem round in cross-section, very slender, rarely more than 3 dm. high; plants of the Hudson Bay region.
            7. Seeds 1·5 mm. long; petals whitish; stem-leaves remote, linear, 1-2 mm. broad; leafy basal rosette present at flowering time, its round-tipped leaves crowded...............................................4. *E. davuricum*

7. Seeds about 1 mm. long; petals often pinkish; stem-leaves rather numerous, lance-elliptic to oval, 3-8 mm. broad; leafy basal rosette represented at flowering time by dry scale-like vestiges of old rosettes............................................................5. *E. leptocarpum* var. *macounii*

6. Stem 4-angled, up to 1 m. high; principal leaves ovate-lanceolate to ovate, conspicuously toothed....................6. *E. glandulosum* var. *adenocaulon*

5. Stem round in cross-section, without decurrent lines; margins of leaves entire, often revolute.

8. Leaves closely incurved-pubescent above; tips of stems not strongly nodding before flowering; stolons wanting..........................7. *E. leptophyllum*

8. Leaves glabrous above or essentially so; tips of stems and pedicels before flowering nodding; flowering stems arising from tips of slender stolons of the previous year or from scaly bulbs, later sending out filiform stolons.

9. Principal leaves lanceolate, 5-15 mm. broad; fruiting pedicels mostly exceeded by subtending leaves.....................................8. *E. palustre*

9. Principal leaves linear to linear-oblong, 1-5 mm. broad; fruiting pedicels mostly equalling or overtopping the subtending leaves..........................................................8a. *E. palustre* var. *oliganthum*

1. **E. angustifolium** L. (*Chamaenerion spicatum* (Lam.) S. F. Gray; incl. var. *intermedium* (Wormsk.) Fern.) Fireweed. Great Willow-Herb

Thickets, rock outcrops, shores, and waste land throughout the province. Northernmost collection: Baralzon Lake, lat. 60° N., rocky barrens (Scoggan & Baldwin, 1950). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Turtle Mountain, thicket [Dawson, 1875].

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to south-central Baffin I., n. Que., n. Lab., and Nfld., s. to Calif., Ariz., S.D., O., and N.C.; Greenland to about lat. 70° N.; Iceland; Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XXXI].

Forma *albiflorum* (Dumort.) Haussk., with white or whitish petals and sepals, has been collected at Middleboro, Whitemouth, Brokenhead, Norway House, and Nejanilini Lake (lat. 59° 22′ N.). The Norway House collection was reported by Macoun [1894; var. *canescens* Wood].

Forma *spectabile* (Simmons) Fern., with white petals and red sepals, was collected at Churchill by Miss Eva Beckett in 1953.

2. **E. latifolium** L. (*Chamaenerion latifolium* (L.) Sweet) River-beauty

Gravel beaches and floodplains in the northern quarter of the province, except the extreme north. Northernmost collection: Churchill (several collections, the earliest seen being made by Beckett in 1946). Southernmost collection: York Factory, cobble-gravel floodplain of Hayes River (Scoggan, 1949). Earliest collection seen: the foregoing Churchill collection by Beckett. First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to northernmost Ellesmereland), n. Que., n. Lab., and Nfld., s. to Wash., Colo., S.D., James Bay, and e. Que.; Greenland; Iceland; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXXI], and maps of the circumpolar distribution are given by Fernald [1925, p. 337, fig. 64; 1929, p. 1946, fig. 18].

3. **E. paniculatum** Nutt.

A specimen has been seen only from Stony Mountain, near Winnipeg, where it was collected on "open ground and old roads" by Macoun in 1896. First report: Burman [1910].

Temperate ~~eastern~~ western American: B.C. to s. Man., s. to Calif., Ariz., Colo., and S.D.; adventive in w. Que.

4. **E. davuricum** Fisch.

Specimens have been seen from the following localities: Churchill (Macoun, 1910; Porsild, 1930; Polunin, 1936); Mosquito Point, 7 miles north of Churchill, open forest and muskegs, river-banks (Porsild, 1930). First report: [Raup, 1947; map of the American distribution, pl. XXXI, showing the Churchill station].

Subarctic circumpolar: Seward Pen., Alaska, and n. coast of Yukon and nw. Mack. to Great Bear L., south-central Keewatin, and n. Man., s. to s. B.C., James Bay, and Nfld.; n. Eurasia.

5. **E. leptocarpum** Haussk. var. **macounii** Trel.

A specimen has been seen from Mile 214 (distance from The Pas) of the Hudson Bay Railway (J. H. Emerton, 1917; determined by Fernald). First report (with citation of locality): the present publication; but accredited to Manitoba in the range given by Fernald [1950].

(Subarctic-)temperate American: B.C. to n. Nfld., s. to Wash., Ida., central Man., and N.S.

6. **E. glandulosum** Lehm. var. **adenocaulon** (Haussk.) Fern. (*E. adenocaulon* Haussk.)

Damp thickets, shores, and clearings throughout the province except the extreme north. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., black spruce woods and lake shore (Baldwin, 1951). Earliest collection seen: Birds Hill near Winnipeg (Fletcher, 1896). First report: Warren Landing [Lowe, 1920]. Probable basis of reports of *E. tetragonum* L. from York Factory and "Echimamish River to Oxford House" by Bell [1881].

Subarctic American: n. Alaska to n. Man., n. Que., and Nfld., s. to Oreg., Nev., N.M., Mo., O., and Pa.; introduced into Europe.

7. **E. leptophyllum** Raf. (*E. densum* of auth., not Raf.; *E. lineare* of auth., not Muhl.)

Damp ground in the southern half of the province. Northernmost collection: Manistikwan Lake, near Flin Flon (Freedman, 1952). Earliest collection seen: Muskeg Island, Lake Winnipeg, "peat bogs and marshes" (Macoun, 1884). First report: the present publication. Probable basis of reports of *E. palustre* var. *lineare* from the province by Bell [1881] and Christy [1887], and the listing of *E. lineare* Muhl. by Lowe [1943].

Temperate American: Alta. to e. Que., s. to Colo., Kans., O., and Va.

8. **E. palustre** L.

Damp to wet ground almost throughout the province except the northeastern Barren Grounds and the southwestern prairie region. Northernmost collection: Nueltin Lake, lat. 59° 43′ N. (Baldwin, 1951). Earliest collection seen: Doghead Point, at The Narrows, Lake Winnipeg, boggy places (Macoun, 1884). First report: Burman [1910].

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to central Keewatin, n. Lab., and Nfld., s. to Wyo., Ont., and Ct.; southern half of Greenland; Iceland; Eurasia.

8a. **E. palustre** var. **oliganthum** (Michx.) Fern. (*E. oliganthum* Michx.)

Specimens have been seen from the following localities: The Pas, on clumps of moss in open field (Krivda, 1950); Reindeer Lake, lat. 57° 37′ N., open black spruce bog (Baldwin, 1951); Churchill, muddy edge of pools (MacKinnon, 1947). First report: Lowe [1943].

Subarctic American: Alta. to Lab. and Nfld., s. to Minn., Ont., and N.E.

*E. coloratum* Biehler, with mature coma (tufts of hair) of seeds cinnamon-coloured, is listed by Burman [1910], Jackson *et al.* [1922], and Lowe [1943], and is reported from "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" by Bell [1880]. In the absence of supporting specimens, however, it should be excluded from our flora for the present.

*E. strictum* Muhl., differing from *E. leptophyllum* in its horizontally divergent pubescence, is listed by Jackson *et al.* [1922] and Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora for the present.

## 4. OENOTHERA L.

## (Evening-Primrose)

1. Capsules club-shaped, sharply 4-angled or 4-winged.
    2. Petals 5-9 mm. long; anthers 1·2-2(-2·8) mm. long....................1. *O. perennis*
    2. Petals up to 25 mm. long; anthers 4-6 mm. long..........2. *O. fruticosa* var. *linearis*
1. Capsules cylindric, many times longer than thick.
    3. Stigma disk-like, indistinctly lobed; calyx-tube funnelform, with 4 prominent keels; anther-filaments of 2 lengths; leaves sharply toothed; plant often much branched and cespitose..................................................3. *O. serrulata*
    3. Stigma with 4 linear lobes; calyx-tube slender; filaments equal.
        4. Petals white, becoming roseate; flower-buds nodding; seeds in 1 row in each cell; leaves pale, linear to lanceolate, entire or remotely and minutely toothed; stems often branched above, with white exfoliating outer layer...........4. *O. nuttallii*
        4. Petals yellow; flower-buds erect; seeds 2-rowed; leaves green, lanceolate, shallowly sinuate-toothed; stems mostly simple.
            5. Tips of reflexed calyx-lobes slightly deflected outward from the direction of the main axis, subtended by an evident auricle; petals 10-15 mm. long; stem-leaves rather fleshy, passing gradually into leafy persistent bracts; stem rarely branching, at least the upper part usually with longer reddish-based hairs...5. *O. parviflora*
            5. Tips of reflexed calyx-lobes arching or extended straight back; stem-leaves thinner; petals 10-25 mm. long; bracts shorter than to slightly longer than the capsules, usually deciduous; stem often branching above.
                6. Surface of calyx-lobes, ovaries, and capsules clearly visible; leaves green, rather soft, spreading or loosely ascending.....................6. *O. biennis*
                6. Surface of calyx-lobes, ovaries, and capsules hidden by a dense pubescence of long white hairs; leaves canescent, firm, strongly ascending.....................................................6a. *O. biennis* var. *hirsutissima*

1. **O. perennis** L. (*Kneiffia perennis* (L.) Pennell; *O. pumila* L.) Sundrops

Specimens have been seen from the following localities: Lake of the Woods, Man. (Dawson, 1873); "L. Winipeg Valley" (Bourgeau, 1857); Teulon, about 30 miles north of Winnipeg (Simpson, 1934). Reported also from Stony Mountain and Killarney by Lowe [1943], but the Killarney specimen proved referable to *O. serrulata.* First report: Jackson *et al.* [1922; as *Kneiffia pumila*].

(Subarctic-)temperate eastern American: e. Man. to Nfld., s. to Mo., Ind., O., and Ga.

2. **O. fruticosa** L. var. **linearis** (Michx.) S. Wats.

A single specimen has been seen, from Birds Hill, near Winnipeg, where it was collected on stony ground by Mrs. H. A. Fowler in 1954. First report: the present publication. Probable basis of the citation of *Kneiffia fruticosa* (L.) Raimann from Victoria Beach by Lowe [1943], and basis of his citation of *Kneiffia pratensis* Small from Birds Hill.

Temperate eastern American: se. Man. to N.E., s. to Mo., Mich., and Md.

3. **O. serrulata** Nutt. (*O. leucocarpa* Comien; *Meriolix serrulata* (Nutt.) Walp.; *M. intermedia* Rydb.)

Dry prairie, sandhills, and roadsides of southern Manitoba. Northernmost collection: Rossburn, about 65 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Garry, dry plains (Macoun, 1872). First report: "Red and Assinaboine Rivers" [Hooker, 1834].

Temperate western American: Mont. to s. Sask. and s. Man., s. to N.M., Tex., Mo., and Wisc.

4. **O. nuttallii** Sweet (*O. pallida* of auth., not Lindl.; *Anogra nuttallii* (Sweet) A. Nels.) White Evening-Primrose

Prairie, sandhills, and roadsides of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, prairie slopes and sandhills (Scoggan, 1951). Earliest collection seen: Rat Creek, south of Winnipeg (Macoun, 1872). First report: Jackson *et al.* [1922]. Basis of reports of *O. albicaulis* Pursh (leaves deeply pinnatifid, rather than entire) from the province.

Temperate western American: s. B.C. to s. Man., s. to Colo., Neb., Minn., and Wisc.

5. **O. parviflora** L. (*O. muricata* L.) Evening-Primrose

Sandy shores, rock outcrops, and clearings in the southern half of the province. Northernmost collection: Minago River north of Lake Winnipeg, granite shores (Scoggan, 1948). Earliest collection seen: Muskeg Island, Lake Winnipeg, sandy shore (Macoun, 1884). First report: near Carberry [Shimek, 1927].

(Subarctic-)temperate eastern American: Sask. to Nfld., s. to N.Y. and N.S.

6. **O. biennis** L. Evening-Primrose

Sandy or gravelly shores, rock outcrops, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, sandy railway bank (Schofield, 1950). Earliest collection seen: Turtle Mountain, thicket (Burgess, 1873). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

(Subarctic-)temperate American: se. Alta. to Nfld., s. to Ida., N.D., Ark., Tenn., and n. Fla.

6a. **O. biennis** var. **hirsutissima** Gray (*O. strigosa* (Rydb.) Mack. & Bush)

Specimens have been seen from the following localities: Fort Garry (A. & D. Löve, 1951); Pilot Mound, about 60 miles southwest of Portage la Prairie (A. & D. Löve, 1953); Virden, about 45 miles west of Brandon, clearing (Scoggan, 1953); St. Lazare, about 75 miles northwest of Brandon, clearing (Scoggan, 1953); The Pas (Krivda, 1949). First report: Lowe [1943].

Temperate American: B.C. to s. Que., s. to Mex., Ariz., Tex., Kans., and Pa.

*O. cespitosa* Nutt. (*Pachylophus cespitosus* (Nutt.) Raim.), with large scapose flowers from a rosette of sinuate-dentate leaves, is cited from Reston by Jackson *et al.* [1922] and also from Birds Hill by Lowe [1943]. No specimens have been seen, however, and it must be excluded from our flora for the present.

*O. triloba* Nutt. (*Lavauxia triloba* (Nutt.) Spach), with ovoid to ellipsoid, strongly winged capsules, and large, pale yellow to white or roseate, scapose flowers from a rosette of runcinate-pinnatifid leaves, is listed by Jackson *et al.* [1922], but probably in error, according to Lowe [1943]. It should be excluded from our flora.

*O. triloba* var. *ecristata* Jones (*Lavauxia flava* (A. Nels.) Garratt) is accredited to southwestern Manitoba by Lowe [1943], but no specimens have been seen, and it should be excluded from our flora for the present.

### *Ludwigia* L.

*L. palustris* (L.) Ell. var. *americana* (DC.) Fern. & Grisc. (*Isnardia palustris* L. var. *americana* DC.), Water-Purslane: the main form is listed by Jackson *et al.* [1922], but no specimens of the North American plant have been seen, and it should be excluded from our flora.

# 81. HALORAGACEAE

## (Water-Milfoil Family)

### 1. Myriophyllum L.

### (Water-Milfoil)

1. Upper floral bracts entire; bractlets at base of flower entire or merely finely toothed; stems whitened in drying.
    2. Floral bracts scattered, subtending 1 or 2 flowers, the upper ones promptly deciduous; bractlets finely toothed; leaves 3-12 mm. long, with 3-7 pairs of stiffish divisions........ .......................................................... 1. *M. alterniflorum*
    2. Floral bracts and flowers whorled, the upper bracts persistent; bractlets entire; leaves 1·2-3 cm. long, with 6-11 pairs of flaccid or slightly stiff divisions..................... .......................................................... 2. *M. exalbescens*
1. Upper bracts pinnate; bractlets palmately 7-lobed; leaves 1·5-4·5 cm. long, with 9-13 pairs of flaccid divisions; stems scarcely whitened in drying........................ ............................................ 3. *M. verticillatum* var. *pectinatum*

1. **M. alterniflorum** DC.

Specimens have been seen from the following localities: Reindeer Lake, lat. 57° 54′ N., silted sandy bottom 3 feet deep (Baldwin, 1951); Cochrane River, lat. 58° 58′ N. (Baldwin, 1951). First report: Cochrane River and Reindeer Lake [Baldwin, 1953].

Subarctic ?circumpolar: Seward Pen., Alaska, to n. Man., James Bay, central Lab., and Nfld., s. to n. Minn. and Conn.; sw. Greenland; Iceland; Europe; n. Afr.

2. **M. exalbescens** Fern. (*M. spicatum* of Am. auth., not L.; subsp. *exalbescens* (Fern.) Hult.) [*See* Patten, Rhodora 56: 213-225. 1954].

Shallow water and swampy ground throughout the province except the extreme north. Northernmost collection: Mosquito Point, 7 miles north of Churchill, small muskeg pond (Porsild, 1930). Earliest collection seen: Rapid City, about 20 miles north of Brandon, pools (Macoun, 1896). First report: Churchill [Radforth, 1950 (with mark of interrogation)]. Basis of reports of *M. spicatum* from near Portage la Prairie by Macoun [1877], from Churchill River by Bell [1880], and from various localities by Lowe [1943].

(Arctic-)subarctic American: Seward Pen., Alaska, to nw. Mack., n. Man., James Bay, se. Lab., and Nfld., s. to s. Calif., Ariz., Kans., Minn., O., and W. Va.; isolated in south-central Baffin I.; sw. Greenland. A map of the distribution is given by Löve [Svensk Botanisk Tidskrift 48: 227 (fig. 4) 1954].

3. **M. verticillatum** L. var. **pectinatum** Wallr.

Specimens have been seen from the following localities: Lyleton, about 75 miles southwest of Brandon, shallow water (Scoggan, 1951); Portage la Prairie (McMorine, 1896); Porcupine Mountain (Macoun, 1881). First report: Porcupine Mountain [Jackson *et al.*, 1922]. Basis of the report of the main form from this locality by Macoun [1883] and Lowe [1943]. The citation from Sturgeon Creek by Lowe is referable to *M. spicatum* var. *exalbescens*, being based upon collections by Cox in 1921 and Marquardt in 1932.

(Subarctic-)temperate circumpolar: B.C. to Nfld., s. to Utah, Ill., Ind., and Del.; Eurasia.

## 82. HIPPURIDACEAE

(Mare's-tail Family)

### 1. Hippuris L.

(Mare's-tail)

1. Leaves linear-attenuate, up to 3·5 cm. long (or flaccid submersed leaves up to 6 cm. long), in whorls of 6-12 .......... 1. *H. vulgaris*
1. Leaves elliptic to oblong-obovate, obtuse, up to 1·5 cm. long, in whorls of 3-6; plant of the Hudson Bay region .......... 2. *H. tetraphylla*

1. **H. vulgaris** L.

Swampy ground and shallow water almost throughout the province except the extreme north. Northernmost collection: Nueltin Lake, lat. 59° 48′ N. (Baldwin, 1951). Earliest collection seen: Churchill (McTavish, 1853). First report: Churchill River [Bell, 1880].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to northernmost Baffin I.), n. Que., n. Lab., and Nfld., s. to N.M., Neb., Ind., and n. N.E.; Greenland; Iceland; Eurasia.

Forma *fluviatilis* (Coss. & Germ.) Glück, the submersed form with flaccid leaves up to 6 cm. long, is common throughout the Manitoba area.

2. **H. tetraphylla** L. f. (*H. vulgaris* var. *maritima* of Am. auth., not Wahl.)

Specimens have been seen from the following localities: Hayes River, near York Factory (Richardson, undated; presumably collected during the Franklin expeditions of 1819-22); Churchill (Gillett, 1948, pool; Beckett, 1950). First report: near York Factory ["H", Richardson, in Franklin, 1823]. Basis of the citation of *H. maritima* from near York Factory by Hooker [1834].

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to se. Lab. and Nfld., s. to s. B.C., James Bay, and e. Que.; Eurasia.

## 83. ARALIACEAE

(Ginseng Family)

### 1. Aralia L.

1. Leaflets cordate at base, doubly serrate; umbels numerous in a narrow panicle on a zigzag leafy stem .......... 1. *A. racemosa*
1. Leaflets tapering to rounded at base, once serrate.
    2. Stem bristly at base, leafy; umbels subcorymbose .......... 2. *A. hispida*
    2. Stem smooth, with a single long-stalked leaf at base: umbels subumbellate .......... 3. *A. nudicaulis*

1. **A. racemosa** L. Spikenard

Specimens have been seen from the following localities: Gimli, about 45 miles north of Winnipeg (Golden, 1920); Camp Morton, about 50 miles north of Winnipeg, moist woods (Lowe, 1943). First report: Victoria Beach [Jackson *et al.*, 1922]. Cited also from Waugh, near the Ontario boundary east of Winnipeg, by Lowe [1943].

Temperate eastern American: se. Man. to e. Que., s. to Kans., Mo., Ala., and Ga.

2. **A. hispida** Vent. Bristly Sarsaparilla

Sandy pine woods, rock outcrops, and clearings in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, gravelly places (Scoggan, 1949). Earliest collection seen: Dawson Road, se. Man., among rocks (Burgess, 1873). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880]. Probable basis of the citation of *A. spinosa* L. from Lake Winnipeg by Bourgeau [in Palliser, 1863].

(Subarctic-)temperate eastern American: central Man. to s. Lab. and Nfld., s. to Minn., Ill., O., and N.C.

3. **A. nudicaulis** L. Wild Sarsaparilla

Woods, thickets, gravel ridges, and rock outcrops in the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 23′ N., gravel by creek (Baldwin, 1951). Earliest collection seen: Grindstone Point, north of Hecla Island, Lake Winnipeg, damp woods (Macoun, 1884). First report: Souris River, thicket [Dawson, 1875].

(Subarctic-)temperate American: n. B.C. to n. Man., s. Lab., and Nfld., s. to Ida., Colo., Neb., Mo., Tenn., and Ga.

### *Panax* L.

*P. quinquefolius* L., Ginseng, with a whorl of 3 palmately-divided leaves below the inflorescence, is listed by Lowe [1943] for southeastern Manitoba and is accredited to the province in the range given by Fernald [1950]. No specimens have been seen, however, and it should be excluded from our flora for the present.

### *Oplopanax* (T. & G.) Miq.

*O. horridus* (Sm.) Miq., Devil's-club, a densely prickly shrub with simple leaves, is cited from Winnipeg by Smith [N. Am. Fl. 28B: 11. 1944]. Manitoba, however, does not fall within the range given in current manuals [*see also* Fernald, 1925, map 22, p. 257], and the species should be excluded from our flora.

## 84. UMBELLIFERAE

## (Parsley Family)

1. Fruit covered with hooked or barbed spreading prickles.
    2. Flowers greenish-white, in capitate clusters, these irregularly paniculate; fruit hooked at apex; involucral bracts merely toothed; leaves bluish-green, mostly 5-palmate..........1. *Sanicula*
    2. Flowers white, in compound umbels, these becoming strongly concave; central floret of each umbellet usually dark purple; fruit barbed at apex; involucral bracts parted into linear lobes; leaves green, pinnately decompound..........15. *Daucus*

1. Fruit smooth or hairy, without spreading prickles.

3. Axils of upper leaves bearing clustered bulblets; (*C. bulbifera*).............4. *Cicuta*

3. Axils without bulblets.

4. Fruit linear or linear-olbong, mostly 3 or more times as long as broad; flowers white.

5. Leaves 3-foliolate, often deeply lobed; fruits 4-6 mm. long, smooth, often curved, on very unequal pedicels....................................5. *Cryptotaenia*

5. Leaves ternately compound; fruits clavate, mostly 1 cm. long or more, straight or only slightly curved, appressed-bristly on the angles, the pedicels subequal.... ........................................................2. *Osmorhiza*

4. Fruit rarely more than twice as long as broad.

6. Flowers yellow.

7. Plants nearly or quite stemless; leaflets finely dissected.

8. Fruit flattened dorsally, the lateral ribs winged.

9. Umbel dense, subglobose; fruit with 1-3 of the dorsal ribs winged, the stylopodium obsolete; bractlet at base of each umbellet solitary, deeply 5-7-cleft; plant glabrous.............................10. *Cymopteris*

9. Umbel open in fruit; dorsal ribs of fruit not winged; stylopodium definite; bractlets several, distinct; plants tomentose to villous, sometimes glabrate ........................................................11. *Lomatium*

8. Fruit slightly flattened laterally, wingless, the stylopodium definite; bractlets few, distinct; plant essentially glabrous.................12. *Musineon*

7. Plants with leafy stems.

10. Leaflets much dissected, the ultimate segments linear.

11. Fruit dorsally flattened, the lateral ribs conspicuously winged; introduced..........................................16. *Anethum*

11. Fruit slightly flattened laterally, wingless; native.......12. *Musineon*

10. Leaflets merely toothed or lobed.

12. Fruit strongly flattened dorsally, the lateral ribs winged; stylopodium depressed; leaves pinnate; stem grooved................13. *Pastinaca*

12. Fruit scarcely flattened; stylopodium wanting; leaves, or at least some of them, ternately compound.

13. Central flower and fruit of each umbellet sessile; ribs of fruits wingless..............................................3. *Zizia*

13. Flowers all pedicelled; fruits with at least some of the ribs winged... ................................................9. *Thaspium*

6. Flowers white or sometimes purplish.

14. Plants nearly or quite stemless; leaflets finely dissected.

15. Characters as above (lead 9)... .......................10. *Cymopteris*

15. Characters as above (lead 9)...........................11. *Lomatium*

14. Plants with leafy stems.

16. Leaves ternately compound.

17. Fruit strongly flattened dorsally, the lateral ribs winged; marginal flowers of the umbellets up to 1·5 cm. broad, their petals very unequal; stem grooved; plant woolly........................14. *Heracleum*

17. Fruit slightly flattened laterally, wingless; flowers relatively small; stem not grooved; plant glabrous...................7. *Aegopodium*

16. Leaves pinnate or pinnately compound; fruits more or less flattened laterally, wingless or with merely prominent ribs.

18. Leaves once pinnate, the leaflets sharply toothed; fruit prominently ribbed, the stylopodium depressed; bracts and bractlets numerous.... ......................................................8. *Sium*

18. Leaves decompound; fruit less prominently ribbed, the stylopodium conic.

19. Leaflets finely dissected, the ultimate segments linear or filiform; plant of waste places................................6. *Carum*

19. Leaflets merely toothed or sparingly lobed; plant of wet habitats... ..............................................4. *Cicuta*

## 1. Sanicula L.

(Sanicle. Black Snakeroot)

### 1. **S. marilandica** L.

Woods and thickets in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, woods (Scoggan, 1948). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Red River [Dawson, 1875].

(Subarctic-)temperate American: n. B.C. to central Man., James Bay, and n. Nfld., s. to n. N.M., Mo., and n. Fla. A map of the distribution, on which the Cross Lake station of central Manitoba should be indicated, is given by Shan & Constance [Univ. Calif. Publ. Bot. 25: 44 (fig. 45). 1951].

## 2. Osmorhiza Raf.

(Sweet Cicely)

[*See* Constance and Shan, 1948.]

1. Bractlets present at base of pedicels of the umbellets (more or less deciduous at fruiting maturity).
    2. Stylopodium with styles 2-4 mm. long; body of fruit 1·2-1·5 cm. long; stipules densely long-hairy near margin........................................1. *O. longistylis*
    2. Stylopodium with styles 0·7-1·5 mm. long; body of fruit 1-1·3 cm. long; stipules glabrous except for ciliate margin....................................3. *O. claytoni*
1. Bractlets wanting.
    3. Stylopodium broader than high, with the styles 0·3-0·5 mm. long; body of fruit 8-12 mm. long........................................................2. *O. obtusa*
    3. Stylopodium higher than broad, with the styles about 1 mm. long; body of fruit 11-17 mm. long........................................................*O. chilensis*

### 1. **O. longistylis** (Torr.) DC. Anise-root

Rich woods and thickets of southern Manitoba. Northernmost collection: Fort Ellice, about 70 miles northwest of Brandon (Macoun & Herriot, 1906). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1859). First report: Winnipeg [Bourgeau, in Palliser, 1863].

Temperate American: s. Alta. to e. Que., s. to ne. N.M., Tex., and Ga. A map of the distribution is given by Constance & Shan [1948, p.132, fig. 4].

### 2. **O. obtusa** (C. & R.) Fern.

Specimens have been seen from the following localities: Doghead Point, at the north end of The Narrows, Lake Winnipeg, rich damp woods, (Macoun, 1884); Riding Mountain, sandy soil under spruce (Rowe, 1950). First report: Riding Mountain [Lowe, 1943].

(Subarctic-)temperate American: sw. Alaska to south-central Man., s. James Bay, s. Lab., and Nfld., s. to n. Calif., Ariz., N.M., S.D., n. Minn., and n. Me. A map of the distribution is given by Constance & Shan [1948, p. 136, fig. 5].

3. **O. claytoni** (Michx.) Clarke (*O. brevistylis* DC.)

A single specimen has been seen, from Riding Mountain, where it was collected in a poplar woods by T. Mosquin in 1954. First report: "From Prince Edward Island west to Lake Winnipeg" [J. M. Macoun, 1895].

Temperate American: s. Sask. to e. Que. and N.S., s. to n. Ark., n. Ala., and N.C. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Constance & Shan [1948, fig. 4].

*O. chilensis* H. & A. (*O. divaricata* Nutt.) is listed by Burman [1910] and Jackson *et al.* [1922; as *Washingtonia divaricata*], and is cited from Winnipeg, Victoria Beach, and Carman by Lowe [1943]. No specimens have been seen, however, nor are Manitoba stations indicated on the maps of Fernald [1925, p. 255, fig. 21] or of Constance & Shan [1948, p. 136, fig. 5]. It should be excluded from our flora for the present.

### 3. ZIZIA W. D. J. Koch

1. Basal leaves cordate, undivided..........................................1. *Z. aptera*
1. Basal leaves ternately compound..........................................2. *Z. aurea*

1. **Z. aptera** (Gray) Fern. (*Z. cordata* of auth., not *Smyrnium cordatum* Walt.)

Woods, thickets, meadows, and prairie in the southern half of the province. Northernmost collection: Clearwater Lake, 25 miles northwest of The Pas (Krivda, 1949). Earliest collection seen: Fort Garry (Macoun, 1872). First report: the present publication. Basis of reports of *Z. cordata* (Walt.) Koch [*Smyrnium cordatum* Walt.; *Thaspium trifoliatum* (L.) Gray; *see* Fernald, Rhodora 41: 441-443. 1939] from Red River and Winnipeg River by Hooker [1834].

Temperate American: B.C. to s. Ont. and R.I., s. to Oreg., Utah, Mo., Ala., and Ga.

2. **Z. aurea** (L.) W. D. J. Koch Golden Alexanders

Similar habitats in the southern quarter of the province. Northernmost collection: Fairford, about 110 miles north of Portage la Prairie, limestone substratum (Scoggan, 1951). Earliest collection seen: Selkirk, open thickets (Macoun, 1884). First report: Jackson *et al.* [1922].

Temperate eastern American: Sask. to Que., s. to Tex., Mo., Tenn., and Ga.

### 4. CICUTA L.

### (Water-Hemlock)

[*See* Mathias and Constance, 1942.]

1. Axils of upper leaves bulblet-bearing; leaflets linear......................1. *C. bulbifera*
1. Axils without bulblets; leaflets broader.
    2. Fruit constricted between the two carpels, broader than long, its ribs subequal in width; leaflets narrowly lanceolate to narrowly elliptic...........2. *C. mackenzieana*
    2. Fruit not constricted between the carpels, as long as or longer than broad, its lateral ribs closely contiguous and forming a broad flat band; leaflets often broader.........................................................3. *C. maculata*

1. **C. bulbifera** L.

Shores and swampy ground in the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 23′ N., marsh (Baldwin, 1951). Earliest collection seen: York Factory (Richardson; specimen undated, but presumably collected during the Franklin expeditions of 1819-22; the earliest dated collection seen was made at Gimli by Dudley in 1930). First report: "Assiniboine R. banks, Gimli and eastern area" [Lowe, 1943].

(Subarctic-)temperate American: B.C. to n. Alta., n. Man., s. James Bay, and Nfld., s. to Oreg., Mont., Neb., O., and Va.

2. **C. mackenzieana** Raup

Swampy ground and shores in the northern half of the province. Specimens have been seen from the following localities: Wekusko Lake, about 90 miles northeast of The Pas, wet ground (Scoggan, 1949); York Factory, muskeg forest (Scoggan, 1949); Churchill (several collections, the first evidently by Macoun in 1910); Reindeer Lake, lat. 57° 37′ N. and 57° 57′ N., silted shore (Baldwin, 1951). First report: Churchill [Raup, Journ. Arnold Arb. 17: 280. 1936]. Probable basis of the citation of *C. virosa* L. from York Factory by Bell [1881] and from Churchill by Størmer [1933], and of *C. occidentalis* Greene from Churchill by Gröntved [1936].

Subarctic American: Seward Pen., Alaska, to n. Man., s. to s. Mack., n. Sask., and James Bay.

3. **C. maculata** L.

Damp to swampy ground and shores in the southern two-thirds of the province. Northernmost collection: Nelson River, 10 miles west of Gillam Island, about 30 miles west-southwest of York Factory, gravel beach (Scoggan, 1949). Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: Winnipeg and N.W. Angle Road [Dawson, 1875].

Subarctic American: central Alaska to n. Man. and e. Que., s. to Wyo., Tex., Mo., Tenn., and N.C.

### 5. CRYPTOTAENIA DC.

(Honewort)

1. **C. canadensis** (L.) DC.

Specimens have been seen only from Morden, where it was first collected by Macoun in 1896. It is a species of rich damp woods. First report: Red River [Bourgeau, in Palliser, 1863].

Temperate eastern American: s. Man. to N.B., s. to Tex., Ark., Ala., and Ga.

### 6. CARUM L.

(Caraway)

1. C. CARVI L.

Old fields and clearings in the southern three-quarters of the province. Northernmost collection: York Factory, clearing (Scoggan, 1949). Earliest collection seen: Oxford House on Oxford Lake (Bell, 1880). First report: "Oxford House to Knee Lake" [Bell, 1881].

European: naturalized in North America.

### 7. AEGOPODIUM L.

### (Goutweed)

1. A. PODAGRARIA L.

Known in the province only from Morden, where it was collected by Groh in 1922. It is a species of roadsides and waste places in North America. First report: Morden [Groh & Frankton, 1948].

European: naturalized in North America.

### 8. SIUM L.

### (Water-parsnip)

1. **S. suave** Walt. (*S. cicutaefolium* Schrank)

Swampy ground, shores, and shallow water almost throughout the province except the extreme north. Northernmost collection: Cochrane River, lat. 58° 58′ N., silted shore (Baldwin, 1951). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Turtle Mountain [Dawson, 1875; as *S. lineare* Michx.].

Subarctic American: central Alaska to n. Man. and Nfld., s. to Calif., Kans., O., and Fla.

### 9. THASPIUM Nutt.

### (Meadow-parsnip)

1. Basal and principal stem-leaves twice pinnate or ternate-pinnate........1. *T. barbinode*
1. Basal leaves simple or once ternate.................................*T. trifoliatum*

1. **T. barbinode** (Michx.) Nutt.

Woods and thickets. Specimens have been seen from the following localities: Birds Hill, near Winnipeg (Groh, 1945; Scoggan, 1951); Winnipeg (Fowler, 1939; Denike, 1941; Groh, 1945); Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: the present publication.

Temperate eastern American: se. Man. to N.Y., s. to Okla., Miss., and Ga.

*T. trifoliatum* (L.) Gray: most or all reports of this species from the province appear to be referable to the closely similar *Zizia aptera* (Gray) Fern.

### 10. CYMOPTERIS Raf.

1. **C. acaulis** (Pursh) Raf.

Specimens have been seen from the following localities: Carberry, about 25 miles east of Brandon, sandhills (A. & D. Löve, 1954); Rock Lake, about 50 miles southeast of Brandon (Thomas, 1938); Glenboro, about

35 miles southeast of Brandon, sandhills (Scoggan, 1953); Brandon, dry sandy hills (Stevenson, 1953); Routledge, about 40 miles west of Brandon, sandhills (Scoggan, 1953). Reported also from Aweme, about 20 miles southeast of Brandon, by Criddle [1927]. First report: Souris River [Macoun, 1883].

Temperate western American: Alta. to s. Man., s. to Oreg., Colo., and Okla. A map of the distribution, on which the occurrence of the species in southwestern Manitoba should be indicated, is given by Mathias [Ann. Mo. Bot. Gard. 17: 235 (fig. 4). 1930].

### *Phellopterus* Nutt.

*P. montanus* Nutt. (*Cymopterus montanus* (Nutt.) T. & G.), stemless, with winged fruits nearly orbicular in cross-section, is accredited to Manitoba in the range given by Rydberg [1932], and is listed on this basis by Lowe [1943]. No specimens have been seen, however, nor are Manitoba stations shown on the map of the distribution given by Mathias [Ann. Mo. Bot. Gard. 17: 239 (fig. 6), 1930]. The species should be excluded from our flora for the present.

### 11. LOMATIUM Raf.

[*See* Mathias, 1938.]

1. Flowers yellow; fruit more or less pubescent, 7-10 mm. long; plant villous to glabrate, stemless............................................1. *L. foeniculaceum*
1. Flowers white; mature fruit glabrous; plants short-stemmed.
    2. Bractlets about equalling the flowers, glabrous or their scarious margins sometimes ciliate toward base; fruit 5-10 mm. long; leaves 3-pinnate; plant soft-puberulent..........................................................2. *L. orientale*
    2. Bractlets equalling to greatly exceeding the flowers, green, more or less tomentose or villous dorsally; fruit 9-20 mm. long; leaves ternate, then 2-3-pinnate; plant tomentose to villous, becoming glabrate...............................3. *L. macrocarpum*

1. **L. foeniculaceum** (Nutt.) C. & R. (*L. villosum* Raf.; *Cogswellia villosa* Spreng.; *C. foeniculacea* (Nutt.) C. & R.; *Peucedanum foeniculaceum* Nutt.)

Specimens have been seen from the following localities: near Pembina Mountain, open prairie (Dawson, 1873–74); Roseisle, about 30 miles south of Portage la Prairie, heavy clay soil (Marshall, 1942); Melita, about 60 miles southwest of Brandon, dry prairie (Scoggan, 1953); Souris Co. (Walker, 1889); Brandon (Dudley, 1941); Miniota, about 50 miles west-northwest of Brandon, denuded crest above Assiniboine River (Scoggan, 1953). Reported also from Lake Winnipeg by Jackson *et al.* [1922] and Macgregor and Morden by Lowe [1943]. First report: "On the Assiniboine, near Brandon, at the narrows of Lake Manitoba..." [Macoun, 1883].

Temperate western American: s. Sask. and s. Man., s. to Tex. and Mo.

2. **L. orientale** C. & R. (*Cogswellia orientalis* M. E. Jones; *Peucedanum orientale* Blankinship)

Specimens have been seen from the following localities: Souris Co. (Walker, 1889); Souris River about 20 miles south of Brandon, prairie slope (Scoggan, 1950). Also reported from Aweme, about 20 miles southeast of Brandon, by Criddle [1927]. First report: Jackson *et al.* [1922]. The citation from Clearwater Creek, near Crystal City, east of Turtle Mountain, by Lowe [1943] is referable to the following species.

Temperate western American: Mont. to s. Man. and Minn., s. to Ariz., N.M., Kans., and Ia.

3. **L. macrocarpum** (H. & A.) C. & R. (*Cogswellia macrocarpa* (Nutt.) Jones; *Peucedanum macrocarpum* Nutt.)

Specimens have been seen from the following localities: Souris Co. (Walker, 1889); Clearwater Creek, near Crystal City, east of Turtle Mountain (Thomas, 1938); Brandon (Marshall, 1950); Assiniboine Rapids, near Brandon, dry gravelly soil (Macoun, 1879); Birtle, about 61 miles northwest of Brandon (Macoun & Herriot, 1906); Steeprock, about 100 miles north of Portage la Prairie, limestone substratum (Scoggan, 1951). First report: Lowe [1943; based upon the inclusion of Manitoba in the range given by Rydberg, 1932].

Temperate western American: B.C. to s. Man., s. to Calif. and Colo.

### 12. MUSINEON Raf.

1. **M. divaricatum** (Pursh) Nutt. (Incl. var. *hookeri* (Nutt.) Mathias)

Specimens have been seen from the following localities: Roseisle, about 30 miles south of Portage la Prairie, heavy clay soil (Marshall, 1942); Pembina Mountain, south of Portage la Prairie, open prairie (Burgess, 1874); Brandon, clay prairie (Marshall, 1949); Assiniboine Rapids, near Brandon, exposed slopes (Macoun, 1879); Oak Lake, about 30 miles west of Brandon, prairie slope above Assiniboine River (Scoggan, 1953); Reported also from Morden by Lowe [1943]. First report: Brandon, Pembina Mountain, and Manitoba House, on The Narrows of Lake Manitoba [Macoun, 1883].

The Manitoba material appears to include both the nearly glabrous typical form and the scabrous-stemmed var. *hookeri* (Nutt.) Mathias (*M. trachyspermum* Nutt.; *M. angustifolium* Nutt.), but more collecting at all stages of development should be done before this supposed difference is accepted as significant.

Temperate western American: s. Alta. to s. Man., s. to Nev., Colo., and S.D. A map of the distribution, on which the occurrence of the species in southern Manitoba should be indicated, is given by Mathias [Ann. Mo.Bot. Gard. 17: 237 (fig. 5). 1930].

### 13. PASTINACA L.

(Parsnip)

1. P. SATIVA L.

Roadsides and waste places in the southern two-fifths of the province. Northernmost collection: The Pas, abandoned garden (Krivda, 1951). Earliest collection seen: Brandon, waste lot (Macoun, 1896). First report: Red River [Hooker, 1834].

European: naturalized in North America.

### 14. HERACLEUM L.

### (Cow-parsnip)

1. **H. lanatum** Michx. (*H. maximum* Bartr.)

Thickets, shores, and low ground almost throughout the province except the extreme north. Northernmost collection: Warkworth Creek, about 10 miles south of Churchill, railway gravel (Brown, 1950). Earliest collection seen: Red River, prairie (Dawson, 1873-74). First report: Red River [Dawson, 1875].

Subarctic American: central Alaska to n. Man., north-central Que., and Nfld., s. to Calif., N.M., Kans., O., and Ga. A map of the northern part of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXXI].

### 15. DAUCUS L.

### (Carrot)

1. D. CAROTA L. Wild Carrot. Queen Anne's-lace

The following is the only collection seen: Brandon, escaped from cultivation (Macoun, 1896). First report: the present publication.

European: naturalized in North America.

### 16. ANETHUM L.

### (Dill)

1. A. GRAVEOLENS L.

Specimens have been seen from the following localities: Stony Mountain, near Winnipeg, gravel pit (Scoggan, 1953); Morden, about 60 miles southwest of Winnipeg, roadside near garden (Scoggan, 1953). First report: the present publication.

Asiatic: introduced and naturalized in North America.

## 85. CORNACEAE

### (Dogwood Family)

### 1. CORNUS L.

### (Dogwood)

1. Inflorescence subcapitate, subtended by a large 4-bracted white petal-like involucre; fruit red . . . . . . . . 1. *C. canadensis*

1. Inflorescence cymose, without an involucre; fruit blue or white.
   2. Leaves alternate, mostly clustered toward the ends of the twigs and then appearing whorled; petioles slender, mostly 2-6 cm. long; fruit bluish-black . . . . 2. *C. alternifolia*
   2. Leaves opposite, not in clusters.

3. Cymes paniculate, nearly as long as broad, with bright red branches; fruit white; lateral veins 3 or 4 on each side of midrib........................3. *C. racemosa*
3. Cymes broad and compact, rather flattish-topped; lateral veins 5-8 on each side.
    4. Leaves broadly ovate to roundish, thinly woolly beneath; branches greenish, usually streaked with purple; fruit bluish.........................4. *C. rugosa*
    4. Leaves ovate-lanceolate to broadly ovate, glabrous to long-hairy beneath; branches red or purple; fruit whitish.........................5. *C. stolonifera*

1. **C. canadensis** L. (*Chamaepericlimenum canadense* (L.) Asch. & Graebn.) Bunchberry

Thickets and woods almost throughout the province. Northernmost collection: Nueltin Lake, lat 59° 43′ N., open black spruce woods (Baldwin, 1951). Earliest collection seen: Winnipeg and N.W. Angle Road (Dawson, 1873-74). First report: Winnipeg and N.W. Angle Road [Dawson, 1875].

(Arctic-)subarctic American: north-central Alaska to n. Man., n. Que., n. Lab., and Nfld., s. to Calif., N.M., S.D., O., and Pa.; s. Greenland. A map of the northern part of the distribution is given by Raup [1947, pl. XXXI].

2. **C. alternifolia** L. f. (*Svida alternifolia* (L. f.) Small) Green Osier

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg, woods (Lowe, 1941); Pembina Mountain, south of Portage la Prairie, woods (Lowe, 1941); Victoria Beach, about 55 miles north-northeast of Winnipeg, edge of woods (Breitung, 1949); Riding Mountain (Smith, 1950). First report: Roseisle, about 30 miles south of Portage la Prairie [Lowe, 1943].

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to Mo., Ala., and Ga.

3. **C. racemosa** Lam. (*C. paniculata* L'Hér.; *Svida foemina* of auth., not (Mill.) Rydb.)

Specimens have been seen from the following localities: Emerson, about 55 miles south of Winnipeg (Groh, 1922); Otterburn, about 20 miles south of Winnipeg, thickets by Rat River (Macoun, 1896); Roseisle, about 30 miles south of Portage la Prairie, open woods (Marshall, 1949). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg [Dawson, 1875].

Temperate eastern American: s. Man. to s. Ont. and Me., s. to Okla., Mo., Ky., and Va.

4. **C. rugosa** Lam. (*C. circinata* L'Hér.; *Svida rugosa* (Lam.) Rydb.) Round-leaved Dogwood

Specimens have been seen from the following localities: Whiteshell Forest Reserve, east of Winnipeg, white spruce woods (Dudley, 1938; Scoggan, 1951); Assiniboine River, banks (McMorine, 1896); Victoria Beach, about 55 miles north-northeast of Winnipeg, woods (Neatby, 1929). First report: Lowe [1943].

Temperate eastern American: south-central Man. to e. Que., s. to Ia. and Va.

5. **C. stolonifera** Michx. (var. *riparia* Rydb.; *C. sericea* L., in part) Red Osier. [*See* Fosberg, Bull. Torrey Bot. Cl. 69: 583-589. 1942; Rickett, Brittonia 5: 149-159. 1944.]

Woods, thickets, sandhills, rock outcrops, shores, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857). First report: "North end of Lake Winnipeg" and "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

Subarctic American: north-central Alaska to north-central Man., central Lab., and Nfld., s. to Calif., Mex., N.M., Neb., O., and W. Va. A map of the distribution (incomplete in the north) is given by Rickett [Brittonia 5: 150 (fig. 1). 1944], and one of the northern area is given by Raup. [1947, pl. XXXI].

Forma *baileyi* (C. & E.) Rickett (var. *baileyi* (C. & E.) Drescher; *C. baileyi* Coult. & Evans), differing from the main form in the spreading-villous or woolly pubescence of the under side of the leaves (rather than appressed-pilose to glabrous), has been collected at various localities in the southern half of the province.

Forma *interior* (Rydb.) Rickett (var. *interior* St. John; *Svida interior* Rydb.), with the leaf pubescent of the main form, but peduncles with spreading hairs, and young twigs densely appressed-pubescent to woolly, has been collected by the writer on Turtle and Duck mountains, and at Norway House and Cross Lake.

## 86. PYROLACEAE

### (Wintergreen Family)

1. Leaves scaly; plant waxy-white, blackening in drying; flower solitary, nodding .......... 1. *Monotropa*
1. Leaves broad and green.
    2. Flower solitary, waxy-white, on a 1-2-bracted scape; leaves basal .......... 2. *Moneses*
    2. Flowers racemose or corymbose.
        3. Stem uniformly leafy; flowers corymbose, their styles nearly obsolete .......... 3. *Chimaphila*
        3. Stems leafy only near the base; flowers racemose, with definite styles .......... 4. *Pyrola*

### 1. MONOTROPA L.

1. **M. uniflora** L. Indian-pipe

Spruce woods in the southern half of the province. Northernmost collection: Norway House, off the northeast end of Lake Winnipeg (Richardson, undated, presumably during the period 1819-22; Scoggan, spruce woods, 1948). Earliest collection seen: the foregoing Richardson specimen. First report: Norway House [J. M. Macoun, 1897].

(Subarctic-)temperate American: s. Alaska and se. Yukon to n. Alta., central Man., and Nfld., s. to Calif. and Fla.; Central America; e. Asia.

## 2. MONESES Salisb.

1. **M. uniflora** (L.) Gray One-flowered Pyrola

Woods, chiefly spruce, throughout the province except the extreme north. Northernmost collection: Mosquito Point, 7 miles north of Churchill, open forest and muskeg, river-banks (Porsild, 1930). Earliest collection seen: Observation Point, east coast of Lake Winnipeg opposite Hecla Island (Macoun, 1884). First report: Winnipeg and N.W. Angle Road, thick woods [Dawson, 1875].

Subarctic circumpolar: n. Alaska and nw. Mack. to n. Man., central Lab., and Nfld., s. to Oreg., Utah, Colo., Minn., Mich., and W. Va.; n. Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XXXII].

## 3. CHIMAPHILA Pursh

1. **C. umbellata** (L.) Bart. var. **occidentalis** (Rydb.) Blake (*C. occidentalis* Rydb.) Prince's Pine. Pipsissewa

Specimens have been seen from the following localities: Whiteshell Forest Reserve, east of Winnipeg, dry granite outcrop (Scoggan, 1951); Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1919); Sandilands Forest Reserve southeast of Winnipeg (Dudley, 1938); Victoria Beach, about 55 miles north-northeast of Winnipeg (several collections, the first by Buller in 1917); Elk Island, Lake Winnipeg, north of Victoria Beach, dry woods (Macoun, 1884); Aweme, about 20 miles southeast of Brandon (Criddle, 1926); Flin Flon (Freedman, 1952). First report: Brereton, Sandilands, Reynolds, Victoria Beach, Waugh [Lowe, 1943]. Basis of reports of the main form (Eurasian) from the province.

(Subarctic-)temperate western American: se. Alaska to central Man., s. to Calif., Utah, and Colo.; isolated in n. Mich.; the whole species circumpolar.

## 4. PYROLA L.

### (Pyrola. Wintergreen)

1. Racemes 1-sided; corolla as long as or longer than broad; style straight, longer than the capsule, surrounded by the connivent stamens.
    2. Racemes 6-20-flowered; petals greenish-yellow; style 5-9 mm. long; basal bracts of scape lanceolate, strongly involute; leaves elliptic to ovate, lustrous.....1. *P. secunda*
    2. Racemes 2-10-flowered; petals creamy-white; style 4-6 mm. long; basal bracts ovate to oblong, only slightly involute; leaves ovate to orbicular, often rounded at summit, scarcely lustrous.........................................*P. secunda* var. *obtusata*
1. Racemes spiral; corolla broader than long.
    3. Style straight, less than 1·5 mm. long, surrounded by the connivent stamens; petals white or pinkish, their tips incurving, the corolla subglobose; leaves dull, 1-4·5 cm. long, shorter than to equalling the petiole..............................2. *P. minor*
    3. Style 3-11 mm. long, declined and upcurved; stamens not connivent; petals spreading or only loosely converging.
        4. Calyx-lobes rounded or obtuse, not more than 2 mm. long; corolla greenish-white, the petals converging; anthers terminated by tubes 0·6-0·8 mm. long; leaf-blade usually shorter than the petiole.......................................3. *P. virens*
        4. Calyx-lobes lanceolate to ovate, acutish; petals loosely spreading; anther-tubes very short or obsolete; leaf-blade about equalling to longer than the petiole.

5. Leaf-blades elliptic to obovate, thin, commonly longer than the petioles; petals white or creamy, more than 4 times as long as the calyx-lobes; bracts of raceme linear-subulate........................................4. *P. elliptica*
5. Leaf-blades leathery in texture, usually as short as the petioles; calyx-lobes one-third to three-fifths as long as the petals; bracts of raceme lanceolate to ovate.
    6. Anthers bright lemon-yellow, 1·7-2·3 mm. long, rounded at base, their locules barely constricted above; filaments almost filiform at summit; petals 6-11 mm. long, cream-white or pinkish, thin, translucent, strongly veined, with a pale whitish margin on drying.
        7. Leaf-blade equalling the petiole; flowers few, 2-2·5 cm. broad, the lanceolate sepals erose at apex................................5. *P. grandiflora*
        7. Leaf-blades shorter than the petiole; flowers numerous, rarely more than 1·5 cm. broad, the deltoid sepals entire...5a. *P. grandiflora* var. *canadensis*
    6. Anthers 2-3·6 mm. long, mostly with a short pointed tip at base, their locules definitely constricted above into necks; filaments flat; petals less strongly veined, without a pale whitish margin on drying.
        8. Anthers deep golden-yellow; petals milk-white or creamy, thick and leathery, 6·5-10·5 mm. long; calyx-lobes firm, 3-5-nerved nearly to tip; leaf-blades lustrous, not cordate at base.............6. *P. rotundifolia* var. *americana*
        8. Anthers deep purplish-red; petals deep pink or crimson, rather thin, 6-8 mm. long; calyx-lobes thin, essentially nerveless.
            9. Leaves reniform, lustrous, cordate at base...............7. *P. asarifolia*
            9. Leaves obovate to orbicular, rounded to subcuneate at base, lustreless or dull..................................7a. *P. asarifolia* var. *purpurea*

1. **P. secunda** L. (Incl. var. *obtusata* Turcz.; *Orthilia secunda* (L.) House) One-sided Pyrola

Conifer woods and rock outcrops almost throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet bank (Baldwin, 1951). Earliest collection seen: Lake of the Woods, Man., woods (Dawson, 1873). First report: Winnipeg and N.W. Angle Road [Dawson, 1875].

Arctic circumpolar: n. Alaska, coast of Mack., and west-central Victoria I. to central Keewatin, n. Que., central Lab., and Nfld., s. to Calif., N.M., S.D., O., and Va.; sw. Greenland; Iceland; n. Eurasia. A map of the northern part of the American distribution is given by Raup [1947, pl. XXXII]. The writer agrees with Gleason [1952] that var. *obtusata* Turcz. is merely an ecological form scarcely worthy of recognition.

2. **P. minor** L. (*Braxilia minor* (L.) House)

Cool thickets and woods almost throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet bank and gravel spit (Baldwin, 1951). Earliest collection seen: Victoria Beach, about 55 miles north-northeast of Winnipeg, open woods (Neatby, 1929). First report: north end of Lake Winnipeg [Bell, 1880].

(Arctic-)subarctic circumpolar: n. Alaska and n. Mack. to n. Man., n. Que., n. Lab., and Nfld., s. to Calif., N.M., Minn., and n. N.E., southern half of Greenland; Iceland; n. Eurasia. A map of the northern part of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXXII].

3. **P. virens** Schweigg. (*P. chlorantha* Sw.)

Dry thickets and woods in the southern three-quarters of the province. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., black spruce woods (Baldwin, 1951). Earliest collection seen: Victoria Beach, about 55 miles north-northeast of Winnipeg (Jackson, 1922). First report: Jackson *et al.* [1922].

Subarctic circumpolar: central Alaska to Great Bear L., n. Man., s. Lab., and Nfld., s. to Oreg., Ariz., S.D., and Pa.; Eurasia. A map of the northern part of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXXII].

4. **P. elliptica** Nutt. Shinleaf

Dry or moist woods in the southern half of the province. Northernmost collection seen: Wanless, about 25 miles north of The Pas (L. & R. Bird, 1953). Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: Cross Lake, northeast of Lake Winnipeg [Bell, 1880].

(Subarctic-)temperate American: B.C. to Nfld., s. to N.M., S.D., O., and Pa.; e. Asia (Japan).

5. **P. grandiflora** Radius

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, spruce woods (Schofield, 1950); Mile 349, Hudson Bay Railway, about 20 miles northwest of Gillam (Taverner, 1936); Churchill (several collections, the first by McTavish in 1853). First report; Churchill [Gröntved, 1936]. Probable basis of the citation of *P. rotundifolia* var. *pumila* Hook. from Churchill by Tyrrell [1897].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to s. Ellesmereland), n. Que., n. Lab., and Nfld., s. to n. B.C., s. Alta., nw. Sask., James Bay, and e. Que.; Greenland; n. Eurasia. A map of the American distribution of the collective species is given by Raup [1947, pl. XXXII], and one of the circumpolar distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Hultén [Svensk Botanisk Tidskrift 43: 394 (fig. 2). 1949].

5a. **P. grandiflora** var. **canadensis** (Andres) Porsild

Known in the province only from Nueltin Lake, lat. 59° 43′ N., where it was collected in a wet black spruce woods by Baldwin in 1951. First report: Nueltin Lake [Baldwin, 1953].

(Arctic-)subarctic western American: n. Alaska and nw. Mack., s. to s. Yukon, n. Alta., and nw. Man.

6. **P. rotundifolia** L. var. **americana** (Sweet) Fern. (*P. americana* Sweet)

A single specimen has been seen, from Sandilands Forest Reserve southeast of Winnipeg, where it was collected in a moist open sandy place by Breitung in 1949. Also reported from Spruce Woods Forest Reserve, southeast of Brandon, by Bird [1927]. First report: northern Manitoba [Jackson *et al.*, 1922]. This northern report, as well as the following northern citations of the main form, are probably referable to *P. grandiflora*: between York Factory and Churchill [Rae, 1850]; "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880]; "Echimamish River to Oxford House" and "Around Cross Lake on Nelson River" [Bell, 1881]; Churchill and Mile 445 of the Hudson Bay Railway [Størmer, 1933]. The citation of the main form from near Carberry by Christy [1887] is probably referable to var. *americana*.

Temperate eastern American: s. Man. to e. Que., s. to Minn., Ky., and N.C.

**7. P. asarifolia** Michx.

Thickets, woods, and rock outcrops in the southern two-thirds of the province, except the southwestern prairie region. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Dawson Road, se. Man., woods (Dawson, 1873). First report: Winnipeg and N.W. Angle Road [Dawson, 1875].

(Subarctic-)temperate American: north-central B.C. and n. Alta. to s. James Bay, s. Lab., and Nfld., s. to N.M., S.D., Mich., Ind., and N.E.

7a. **P. asarifolia** var. **purpurea** (Bunge) Fern. (var. *incarnata* (Fisch.) Fern.; *P. uliginosa* Torr.)

Similar habitats as far north as Churchill. Northernmost collection: Churchill (Gardner, 1930). Earliest collection seen: Roblin, southwest of Duck Mountain (Simpson, 1928). First report: near Aweme [Criddle, 1927].

Subarctic American: n. Alaska to n. Man., central Lab., and n. Nfld., s. to Oreg., Colo., S.D., Minn., Ind., and N.E.; e. Asia. A map of the greater part of the American distribution, on which the occurrence of the variety in Manitoba should be indicated, is given by Raup [1947, pl. XXXII].

## 87. ERICACEAE

(Heath Family)

1. Stems ascending.
2. Leaves densely rusty-woolly beneath, the edges strongly inrolled; flowers white, in terminal umbel-like clusters, their petals distinct........................1. *Ledum*
2. Leaves not rusty-woolly beneath.
3. Leaves opposite (rarely in 3's), strongly whitened beneath; flowers purple, saucer-shaped, 1·2-2 cm. broad, slender-pedicelled in terminal umbels; branches 2-edged........................2. *Kalmia*
3. Leaves alternate; flowers white or pinkish, cylindric or urn-shaped, small branches not 2-edged.
4. Leaves brownish-scurfy, especially beneath; flowers in the axils of the upper small leaves, forming small 1-sided leafy racemes............3. *Chamaedaphne*
4. Leaves glabrous or pubescent beneath, not scurfy.
5. Fruit a dry capsule; leaves linear to narrowly oblong, the margins strongly revolute........................4. *Andromeda*
5. Fruit a berry; leaves broader, their margins not revolute.......12. *Vaccinium*

1. Stems depressed, creeping or mat-forming.
  6. Fruit a berry or drupe.
    7. Corolla very deeply 4-parted, its linear lobes reflexed; flowers nodding on slender pedicels; anthers exserted, awnless, with very long terminal tubes; berries pink or red, acid........................................11. *Oxycoccus*
    7. Corolla urn-shaped, with short, erect or spreading lobes (or *Gaultheria hispidula* with bell-shaped, rather deeply 4-cleft, corolla; berries white); anthers included, awned or awnless.
      8. Berries bright white; flowers mostly solitary in the leaf axils, bell-shaped; leaves ovate, 5-10 mm. long, bristly beneath; (*G. hispidula*).............6. *Gaultheria*
      8. Berries or drupes not white; flowers mostly in racemes or clusters, urn-shaped.
        9. Fruit a red, blue, or blackish berry tipped by the calyx-teeth (the ovary inferior)........................................12. *Vaccinium*
        9. Fruit not tipped by the calyx-teeth (the ovary superior).
          10. Stems slender; flowering branches ascending, 5-15 cm. high, leafy at summit, the leaves with "wintergreen" flavour; berries red; (*G. procumbens*)........................................6. *Gaultheria*
          10. Stems stout, the scaly-bracted flowers in terminal clusters; drupes dry or juicy, with 5-10 distinct or fused nutlets...............7. *Arctostaphylos*
  6. Fruit a dry capsule.
    11. Leaves and branchlets densely scurfy with brown scales, the elliptic to oblanceolate leaves 0·5-2 cm. long; flowers purple, 1-2 cm. broad; plant of the Hudson Bay region........................................8. *Rhododendron*
    11. Leaves and branchlets not scurfy.
      12. Leaves oval to orbicular, cordate at base, mostly 2-6 cm. long; corolla salver-shaped, roseate........................................10. *Epigaea*
      12. Leaves linear to elliptic; plants of the Hudson Bay or northern regions.
        13. Corolla narrowly urn-shaped, purplish, 7-8 mm. long; pedicels 1-2 cm. long; leaves linear to narrowly oblong, 4-12 mm. long............5. *Phyllodoce*
        13. Corolla campanulate, smaller, white or roseate; plants densely tufted.
          14. Flowers short-pedicelled; leaves elliptic, 5-8 mm. long....9. *Loiseleuria*
          14. Flowers on pedicels up to 2 or more cm. long; leaves scale-like, 2-3 mm. long........................................*Cassiope*

## 1. LEDUM L.

1. Leaves linear-oblong to oblong, 2-5 cm. long; stamens 5-7, their filaments mostly glabrous; capsules 5-6·5 mm. long, usually about twice as long as thick......1. *L. groenlandicum*
1. Leaves linear to linear-oblong, less than 1·5 cm. long; stamens 10, their filaments pubescent below the middle; capsules 3-4 mm. long, little longer than thick; plant of the Hudson Bay and northern regions........................................2. *L. decumbens*

1. **L. groenlandicum** Oeder (*L. palustre* L. subsp. *groenlandicum* (Oeder) Hult.) Labrador-tea

Peaty soil, conifer woods, and peat bogs throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Warren Landing, near the northeast end of Lake Winnipeg (Lowe, 1918). First report: between York Factory and Churchill [Rae, 1850; as *L. palustre* var. *latifolium*].

(Arctic-)subarctic American: north-central Alaska and nw. Mack. to central Keewatin, n. Que., n. Lab., and Nfld., s. to Wash., south-central Sask., Minn., and Pa. A map of the greater part of the distribution is given by Raup [1947, pl. XXXII].

2. **L. decumbens** (Ait.) Lodd. (*L. palustre* L. var. *decumbens* Ait.)

Tundra and gravel ridges in the northern third of the province. Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, burned area (Schofield, 1950); Herchmer, about 100 miles south of Churchill (Gillett, 1948); Cochrane River, lat. 58° 33′ N. (Baldwin, 1951); Churchill (several collections, the first seen being one made by Macoun in 1910); Nejanilini Lake, lat. 59° 22′ N., gravel ridge (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., bare hillock (Baldwin, 1951); Baralzon Lake, lat. 60° N., rocky tundra (Scoggan & Baldwin, 1950). First report: between York Factory and Churchill [Rae, 1850; as *L. palustre* var. *angustifolium*]. Reports of the species from Whitemouth by Jackson *et al.* [1922] and from Flin Flon and Riding Mountain by Lowe [1943] are undoubtedly referable to *L. groenlandicum.*

Arctic American: n. coast of Alaska, Yukon, and Mack., Victoria I., Baffin I., n. Que., and n. Lab., s. to n. B.C., n. Man., James Bay, and s. Lab.; w. Greenland; e. Asia.

### 2. Kalmia L.

1. Corymbs terminal; pedicels glabrous; leaves revolute-margined; branchlets 2-edged . . . . . . . . . . 1. *K. polifolia*
1. Corymbs lateral; pedicels glandular-puberulent; leaves flat; branchlets round in cross-section . . . . . . . . . . *K. angustifolia*

1. **K. polifolia** Wang. (*K. glauca* Ait.) Bog-Laurel

Peaty soil, muskeg, and tundra almost throughout the province except the southwestern prairie region. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., boggy shore (Baldwin, 1951). Earliest collection seen: Warren Landing, near the northeast end of Lake Winnipeg (Lowe, 1918). First report: Churchill River [Bell, 1880]. Basis of the citation of *K. latifolia* L. from Churchill by Ritchie [1956, p. 309].

(Arctic-)subarctic American: s. Alaska and central Yukon to central Keewatin, n. Lab., and Nfld., s. to Oreg., Ida., Minn., and Pa.

*K. angustifolia* L., Sheep-Laurel, is accredited to Manitoba in the range given by Rydberg [1932] and is listed by Lowe [1943] on this basis. Manitoba is also included in the range given by Fernald [1950], but no specimens have been seen, and it should be excluded from our flora for the present, but carefully searched for.

### 3. Chamaedaphne Moench

### (Leather-leaf. Cassandra)

1. **C. calyculata** (L.) Moench (Incl. var. *angustifolia* (Ait.) Rehd. and var. *latifolia* (Ait.) Fern.; *Cassandra calyculata* D. Don)

Peaty soil, muskeg, and peat pogs almost throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: Muskeg Island, Lake Winnipeg, wet bogs (Macoun, 1884). First report: Winnipeg [Bourgeau, in Palliser, 1863].

(Arctic-)subarctic circumpolar: n. Alaska to s. Keewatin, central Lab., and Nfld., s. to B.C., south-central Sask., n. Ia., O., and Ga.; n. Eurasia.

### 4. ANDROMEDA L.

### (Andromeda)

1. Leaves mostly 2-5 cm. long, whitened beneath with a close minute pubescence; flowers 4-6 mm. long, in nodding rather dense clusters on curved branchlets; pedicels mostly less than 1 cm. long; capsules in dense clusters.....................1. *A. glaucophylla*

1. Leaves mostly 1-3 cm. long, whitened beneath with a glaucous varnish-like coating; flowers 6-7 mm. long, in erect lax clusters on erect branchlets; pedicels mostly 1-3 cm. long, slender, straight; capsules in lax clusters........................2. *A. polifolia*

1. **A. glaucophylla** Link (*A. polifolia* L. subsp. *glaucophylla* (Link) Hult.) Bog-Rosemary

Swampy ground, muskeg, and peat bogs in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, bog (Schofield, 1950). Earliest collection seen: Pinawa Falls, about 50 miles northeast of Winnipeg, peat bog (Neatby & Peterson, 1930). First report: Lake Winnipeg [Fernald, Rhodora 5: 71. 1903].

Subarctic eastern American: n. Man. to Ungava Bay, north-central Lab., and Nfld., s. to Minn., Ind., and N.J.; s. Greenland.

2. **A. polifolia** L.

Swampy ground, peat bogs, muskeg, and tundra throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: "Height of land muskeg between Lake of Woods and Red River" [Dawson, 1875].

(Arctic-)subarctic circumpolar: n. Alaska and coast of Mack. to central Keewatin, n. Que., and n. Lab., s. to Wash., n. Ida., Alta., Ont., and s. Lab.; w. Greenland; n. Eurasia. A map of the greater part of the American distribution is given by Raup [1947, pl. XXXII].

### 5. PHYLLODOCE Salisb.

1. **P. caerulea** (L.) Bab.

Known in the province only from MacLeod Lake, about 115 miles west of Churchill (Miss D. K. Brown, 1950). First report: MacLeod Lake, "decumbent in shade of spruce–larch grove at edge of lake in sandy peaty soil" [Cody, Can. Field-Nat. 67: 134. 1953; with maps, p. 131, showing circumpolar distribution, and p. 133, showing distribution in northeastern North America].

Arctic circumpolar (with large gaps): Alaska south of the Arctic Circle; Coronation Gulf, southern half of Baffin I., n. Que., n. Lab., and Nfld., s. to south-central Keewatin, n. James Bay, C.B., and N.H.; southern half of Greenland; Iceland; n. Eurasia.

### 6. GAULTHERIA L.

1. Flowers borne near the summit of ascending branches 5-15 cm. high; leaves elliptic to narrowly obovate, 1·5-5 cm. long, the non-revolute margins with bristle-tipped teeth; berries red........................................1. *G. procumbens*
1. Flowers borne in the leaf-axils of the prostrate stems; leaves ovate, 5-10 mm. long, bristly beneath, the margins revolute; berries bright white..............2. *G. hispidula*

1. **G. procumbens** L. Teaberry. Checkerberry

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg (Dudley, 1930, 1938); Whiteshell Forest Reserve, east of Winnipeg (Lowe, 1920; Scoggan, 1951, white spruce woods); Brokenhead, about 30 miles northeast of Winnipeg (A. & D. Löve, 1952); Victoria Beach, about 55 miles north-northeast of Winnipeg, sandy jack-pine woods (Scoggan, 1953). First report: Burman [1910].

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Minn., Wisc., Ala., and Ga.

2. **G. hispidula** (L.) Bigel. (*Chiogenes hispidula* (L.) T. & G.) Creeping Snowberry

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg (Dudley, 1930; Breitung, 1949, spruce and cedar swamp); Lake of the Woods, Man. (Jackson, undated); Lac du Bonnet, about 50 miles northeast of Winnipeg, spruce swamp (Breitung, 1949); Doghead Point, at the north end of The Narrows, Lake Winnipeg, peat bogs (Macoun, 1884); Duck Mountain, white spruce woods (Scoggan & Baldwin, 1950); East Mossy portage, between Lake Winnipegosis and Cedar Lake, black spruce woods (Scoggan, 1948); Warren Landing, near the northeast end of Lake Winnipeg (Lowe, 1918). Reported as far north as Flin Flon by Lowe [1943]. First report: Burman [1910].

(Subarctic-)temperate American: B.C. to s. Lab. and Nfld., s. to Ida., Minn., Mich., Pa., and N.C.

### 7. ARCTOSTAPHYLOS Adans.

### (Bearberry)

1. Leaves entire, leathery, obscurely veined; branchlets finely pubescent; drupe dull red, dry and mealy.
   2. Young branchlets viscid.
      3. Branchlets finely tomentose, becoming glabrate....................1. *A. uva-ursi*
      3. Branchlets with long viscid hairs intermixed with black stalked glands..........................................la. *A. uva-ursi* var. *adenotricha*
   2. Young branchlets not viscid, minutely and permanently white-tomentose..........................................1b. *A. uva-ursi* var. *coactilis*
1. Leaves thinner, toothed, prominently veined; branchlets glabrous; drupe juicy; plants of the Hudson Bay and northern regions.
   4. Leaves bristly-ciliate toward base and on petioles, strongly rugose; drupes purple to purplish-black........................................2. *A. alpina*
   4. Leaves not ciliate, less rugose; drupes scarlet..........................3. *A. rubra*

1. **A. uva-ursi** (L.) Spreng. Common Bearberry

Sandhills, rock outcrops, gravel ridges, shores, and woods throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., sandy esker (Baldwin, 1951). Earliest collection seen: Sewell (now Camp Hughes), near Brandon, sandhills (Macoun, 1896). First report: "Nelson River between Lake Winnipeg and the coast of Hudson's Bay" [Bell, 1880].

Subarctic circumpolar: north-central Alaska to Great Bear L., s. Keewatin, James Bay, and Nfld., s. to Wash., N.M., S.D., and Que.; w. Greenland; n. Eurasia. A map of the greater part of the American distribution of the collective species is given by Raup [1947, pl. XXXIII].

1a. **A. uva-ursi** var. **adenotricha** Fern. & Macbr.

Similar habitats and distribution in the province. Northernmost collection: Reindeer Lake, lat. 57° 49′ N., black spruce woods (Baldwin, 1951). Earliest collection seen: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1920). First report: Knee Lake and Hayes River [Scoggan, 1951].

Subarctic American: south-central Alaska and nw. Mack. to n. Man. and e. Que., s. to Mont., n. Minn., and Anticosti I., Que. A map of the distribution, on which the occurrence of the variety in Manitoba should be indicated, is given by Raup [1947, pl. XXXIII].

1b. **A. uva-ursi** var. **coactilis** Fern. & Macbr.

Similar habitats and distribution in the province. Northernmost collection: Churchill, beach flats (Gillett, 1948). Earliest collection seen: Lake Winnipeg Valley (Bourgeau, 1857). First report: Lake Winnipeg Valley [Fernald & Macbride, Rhodora 16: 212. 1914].

Subarctic American: south-central Alaska to n. Man., e. Que., and Nfld., s. to n. Calif., Colo., n. Ill., and Va.

2. **A. alpina** (L.) Spreng. (*Arctous alpina* (L.) Nied.) Alpine Bearberry

Shores, muskeg, and rocky barrens in the northern half of the province. Northernmost collection: Baralzon Lake, lat. 60° N., rocky barrens and hillocks (Scoggan & Baldwin, 1950). Southernmost collection: The Pas (Leslie, undated). Earliest collection seen: Churchill (Rogers, 1936). First report: Churchill River [Bell, 1880].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Banks I.), n. Que., n. Lab., and Nfld., s. to n. B.C., James Bay, e. Que., and N.H.; Greenland; n. Eurasia.

3. **A. rubra** (Rehd. & Wils.) Fern. (*A. alpina* subsp. *rubra* (Rehd. & Wils.) Hult.; *Arctous erythrocarpa* Small)

Similar habitats and distribution in the province. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., barren stony hillside (Baldwin, 1951). Southernmost collection: Hill Lake, north of Lake Winnipeg, heath bog (Scoggan, 1948). Earliest collection seen: Churchill (Macoun, 1910). First report: Churchill (Fernald, Rhodora 16: 24. 1914].

Arctic American: n. coast of Alaska, Yukon, and Mack. to south-central Baffin I., n. Lab., and Nfld., s. to s. B.C., James Bay, and Anticosti I., Que.; e. Asia. A map of the American distribution is given by Raup [1947, pl. XXXIII].

### 8. RHODODENDRON L.

1. **R. lapponicum** (L.) Wahl. Lapland Rosebay

Specimens have been seen only from Churchill, the earliest collection seen from that locality having been made by Macoun in 1910. It is a species of rocky tundra. First report: between York Factory and Churchill [Rae, 1850]. Reported from Gillam, about 165 miles south of Churchill, by Lowe [1943], but supporting specimens have not been seen.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to Devon I.), n. Que., n. Lab., and Nfld., s. to north-central B.C., n. Man., James Bay, Wisc., and N.H.; Greenland; n. Eurasia.

### 9. LOISELEURIA Desv.

(Alpine Azalea)

1. **L. procumbens** (L.) Desv.

Specimens have been seen from the following localities: Churchill (several collections, the first seen being made by Macoun in 1910); Nejanilini Lake, lat. 59° 22′ N., gravel ridge (Scoggan & Baldwin, 1950); Nueltin Lake, lat. 59° 48′ N., bare knoll (Baldwin, 1951); Baralzon Lake, lat. 60° N., dry rocky barrens and hillocks (Scoggan & Baldwin, 1950). First report: between York Factory and Churchill [Rae, 1850; as *Azalea procumbens* L.].

Arctic circumpolar: n. Alaska and n. Yukon to south-central Baffin I., n. Que., n. Lab., and Nfld., s. to s. B.C., s. Mack., n. Man., James Bay, e. Que., and N.H.; Greenland; Iceland; n. Eurasia.

### 10. EPIGAEA L.

1. **E. repens** L. var. **glabrifolia** Fern. Mayflower. Trailing Arbutus

Specimens have been seen from the following localities: Wampum, about 80 miles southeast of Winnipeg (no data); Sandilands Forest Reserve, southeast of Winnipeg (Denike, 1940; A. & D. Löve, 1952); Lewis, about 40 miles east of Winnipeg (Woyna, 1932); Libau, about 25 miles northeast of Winnipeg (Marquardt, 1932); Venlaw, near Dauphin, north of Riding Mountain (Forster, 1927). First report: the present publication. Basis of earlier citations of the main form from the province.

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to Ia., Tenn., and N.C. Accredited to Saskatchewan in the range given by Fernald [Rhodora 41: 446. 1939], but not listed by Fraser & Russell in their 1944 checklist for that province.

## 11. Oxycoccus Tourn.

## (Cranberry)

[*See* Porsild, 1938.]

1. Pedicels essentially glabrous; fruit 5-7 mm. thick; leaves broadest toward base, 2-6 mm. long, their margins strongly revolute............................1. *O. microcarpus*

1. Pedicels pubescent; leaves flat or slightly revolute, broadest near the middle.
   2. Pedicels 1-4, terminal, bearing a pair of scaly bracts; leaves 6-10 mm. long; fruit 8-12 mm. thick....................................2. *O. quadripetalus*
   2. Pedicels 1-10, lateral, bearing 1 or 2 leaf-like green bracts; leaves 6-17 mm. long; fruit 10-20 mm. thick............................................*O. macrocarpus*

1. **O. microcarpus** Turcz. (*Vaccinium oxycoccus* of Am. auth., in part) Small Cranberry

Sphagnum bogs and muskeg in the northern two-thirds of the province. Northernmost collection: Nejanilini Lake, lat. 59° 22′ N., wet tundra (Scoggan & Baldwin, 1950). Southernmost collection: Lake Winnipegosis, black spruce muskeg near Red Deer River (Scoggan & Baldwin, 1950). Earliest collection seen: Churchill (Macoun, 1910; determined by Porsild). First report: Churchill [Størmer, 1933; as *Vaccinium oxycoccus* f. *microcarpum* (var. *microcarpum* Turcz.)]. The Sandilands and Vivian citations by Lowe [1943] are referable to the following species. The Flin Flon and Giroux citations are apparently not supported by specimens, but the latter would almost certainly also be referable to *O. quadripetalus.*

Subarctic circumpolar: n. Alaska to Great Bear L., south-central Keewatin, n. Que., and north-central Lab., s. to B.C., James Bay, and s. Lab.; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXXIII].

2. **O. quadripetalus** Gilib. (*Vaccinium oxycoccus* of Am. auth., in part) Small Cranberry

Similar habitats in the southern half of the province, except the southwestern prairie region. Northernmost collection: Oxford Lake, black spruce muskeg (Scoggan, 1949). Earliest collection seen: north end of Lake Winnipeg, peat bog (Bell, 1879). First report: Oxford Lake [Scoggan, 1951]. Probable basis of the listing of *O. vulgaris* by Burman [1910]. Basis of the citation of *O. microcarpus* from Sandilands and Vivian by Lowe [1943], and probable basis of its citation from Giroux by Jackson *et al.* [1922] and Lowe [1943]. Basis of the citation of *O. palustris* Pers. from Warren Landing by Lowe [1943], and probable basis of its citation from Winnipeg by Bourgeau [in Palliser, 1863] and from Riding Mountain by Halliday [1932] and Lowe [1943].

Subarctic American: central B.C. to n. Sask. and s. Lab., s. to Wash., Alta., Man., Minn., O., and Va.

*O. macrocarpus* (Ait.) Pers. (*Vaccinium macrocarpon* Ait.), Large Cranberry, is listed by Jackson *et al.* [1922] and Lowe [1943], but without locality. Its citation from York Factory by Bell [1881] is probably referable to *O. microcarpus*. It should be excluded from our flora for the present.

## 12. Vaccinium L.

1. Anthers bearing a long pair of horn-like awns on the back at the base of the terminal tubules; flowers mostly axillary.
  2. Leaves thin, smooth and shining, scarcely paler beneath, minutely spinulose-serrate; flowers 5-merous, solitary in the axils............................1. *V. cespitosum*
  2. Leaves firm, dull green above, pale and reticulate beneath, entire; flowers mostly 4-merous, 1-4 from the axils of bud-scales..........................2. *V. uliginosum*
1. Anthers awnless; flowers mostly in close racemes terminating the branchlets.
  3. Leaves evergreen, leathery in texture, 5-18 mm. long, sparsely glandular-dotted beneath; flowers 4-merous; berries red; stems extensively creeping..........................................................3. *V. vitis-idaea* var. *minus*
  3. Leaves deciduous, relatively thin, mostly 1·5-3·5 cm. long, non-glandular; stems ascending; berries blue or black.
    4. Leaves entire, densely soft-pubescent beneath and often above; new branchlets densely velvety...............................................4. *V. myrtilloides*
    4. Leaves minutely serrate with bristle-tipped teeth.
      5. Leaves bright green on both sides; berries blue, with bloom.
        6. Leaves glabrous or nearly so..........................5. *V. angustifolium*
        6. Leaves spreading-pubescent on the nerves beneath..................................................5a. *V. angustifolium* var. *hypolasium*
      5. Leaves blue-green, glabrous, glaucous beneath; berries usually black and without bloom....................................5b. *V. angustifolium* var. *nigrum*

1. **V. cespitosum** Michx. Dwarf Bilberry

Specimens have been seen from the following localities: Riding Mountain (Rowe, 1948); Duck Mountain (Halliday, 1935; Scoggan & Baldwin, 1950, edge of woods). First report (with citation of localities); the present publication. Listed by Lowe [1943] as "Probably frequent in the north."

Subarctic American: south-central Alaska to s. Man., central Lab., and Nfld., s. to Calif., Colo., n. Minn., and n. N.Y.

2. **V. uliginosum** L. (Incl. var. *alpinum* Bigel.) Alpine Bilberry

Muskeg and rocky barrens in the northern third of the province. Northernmost collection: Baralzon Lake, lat. 60° N., sedge-heath tundra and dry rocky barrens (Scoggan & Baldwin, 1950). Southernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Churchill (Macoun, 1910). First report: Churchill River [Bell, 1880].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to north-central Ellesmereland), n. Que., n. Lab., and Nfld., s. to n. Wash., Alta., the Great Lakes region, and N.H.; Greenland; Iceland; Spitsbergen; n. Eurasia. Maps of the American distribution of the main form, and the distribution of var. *alpinum*, are given by Raup [1947, pl. XXXIII].

Some of the Manitoba material appears referable to either forma *pubescens* (Lange) Polunin or var. *alpinum* forma *langeanum* (Malte) Polunin, both of which have leaves puberulent beneath, rather than glabrous on both sides. Concerning subsp. *microphyllum* Lange (var. *alpinum* Bigel.), Gleason [1950] states that "Similar plants occur in our range, but it is not known whether they are the true diploid European variety". Of the main form and var. *alpinum*, Hultén [1948] notes, for the Alaska-Yukon area: "It is, however, hardly possible to find any distinct line of demarcation between these two races. There are intermediate forms especially in the Alaska Range." Concerning the plant of Cook County, northeastern Minnesota, Butters & Abbe [Rhodora 55: 182-183. 1953] write that "Each of the characters, namely, position and relative length of the appendages [anther-horns], size of stamens, size and shape of leaves, relative puberulence of under side of leaves and of young twigs, habit of plant—appears to vary practically independently of the others. . . . At present it is impossible to say which of these characters vary in response to environmental differences and which in response to genetical constitution." The same difficulty has been encountered with the Manitoba material, and until such time as it may be deemed justifiable to separate it into two major entities, no decision can be reached as to which of the puberulent forms is represented.

3. **V. vitis-idaea** L. var. **minus** Lodd. Rock-Cranberry

Woods, rock outcrops, and bogs throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., dry rocky barrens (Scoggan & Baldwin, 1950). Earliest collection seen: Lake Winnipegosis, bogs and swamps (Macoun, 1881). First report: Fernald [Rhodora 13: 137 f. (pl. 88, fig. 5). 1911, map of part of the American distribution showing the occurrence of the variety in Manitoba].

Arctic ?circumpolar: n. coast of Alaska, Yukon, and Mack., Victoria I., s. Baffin I., n. Que., n. Lab., and Nfld., s. to s. B.C., s. Sask., n. Minn., and N.E.; w. Greenland; gap in w. Europe; n. Eurasia. A map of the circumpolar distribution is given by Hultén [Svensk Botanisk Tidskrift 43: 397 (fig. 5). 1949], and of the American distribution by Raup [1947, pl. XXXIII].

4. **V. myrtilloides** Michx. (*V. canadense* Kalm; *Cyanococcus canadensis* (Richards.) Rydb.) Sour-top-Blueberry. Velvet-leaf-Blueberry

Woods, muskeg, and rock outcrops throughout the province except the northeastern Barren Grounds and the southwestern prairie region. Northernmost collection: Nueltin Lake, lat. 59° 43′ N. (Baldwin, 1951). Earliest collection seen: Duck Mountain (Halliday, 1930). First report: Winnipeg [Bourgeau, in Palliser, 1863].

(Subarctic-)temperate American: central B.C. to ne. Alta., se. Mack., s. James Bay, and Nfld., s. to Mont., Sask., ne. Ia., O., and Va.

5. **V. angustifolium** Ait. (*Cyanococcus angustifolius* (Ait.) Rydb.; *V. pensylvanicum* var. *angustifolium* Gray; incl. var. *laevifolium* House (*V. pensylvanicum* Lam.; *V. lamarckii* Camp)) Low Sweet Blueberry

Similar habitats, but usually drier, in the southern half of the province. Northernmost collection: Bear Lake, northwest of Oxford Lake (Moore, 1953). Earliest collection seen: Victoria Beach, about 55 miles north-northeast of Winnipeg (Buller, 1917). First report: Jackson *et al.* [1922].

Subarctic eastern American: Man. to north-central Que., s. Lab., and Nfld., s. to ne. Ia., O., and Va.; accredited to Saskatchewan in the ranges given by Rydberg [1932] and Fernald [1950], but its inclusion by Fraser & Russell in their 1944 checklist of that province is based only upon the citation by Macoun [1884] of *V. pensylvanicum* Lam. from "Newfoundland to the Rocky Mountains".

5a. **V. angustifolium** var. **hypolasium** Fern.

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg, dry sandy jack-pine woods (Scoggan, 1951); Whiteshell Forest Reserve, east of Winnipeg, dry granite outcrops (Scoggan, 1951); Victoria Beach (Jackson, undated). First report: the present publication.

(Subarctic-)temperate eastern American: Man. to Nfld., s. to Minn., Mich., and Va.

5b. **V. angustifolium** var. **nigrum** (Wood) Dole

A specimen has been seen only from Victoria Beach, about 55 miles north-northeast of Winnipeg, where it was collected in peaty ground by T. Mosquin and the writer in 1953. First report: the present publication.

(Subarctic-)temperate eastern American: se. Man. to Nfld., s. to Minn., n. Ind., and W. Va.

### ***Cassiope*** D. Don

*C. tetragona* (L.) D. Don is listed by Jackson *et al.* [1922], and reported by Lowe [1943] from "Northern Manitoba", but without definite locality. Stations for the inclusive species are indicated at York Factory and Churchill on the map given by Raup [1947, p. XXXII]. No Manitoba material has been seen, however, the collection closest to our area evidently being represented by one made at Cape Eskimo (Eskimo Point), southeastern Keewatin, about lat. 61° N. The species should be excluded from our flora for the present.

### ***Gaylussacia*** HBK.

*G. baccata* (Wang.) K. Koch, Black Huckleberry, differing from *Vaccinium* in its 10-locular, rather than 5-locular, ovary, is listed by Jackson *et al.* [1922], and reported by Lowe [1943] from eastern Manitoba, but without definite locality. No Manitoba specimens have been seen, and it should be excluded from our flora for the present.

## 88. DIAPENSIACEAE

(Diapensia Family)

### 1. Diapensia L.

1. **D. lapponica** L.

Known in the province only from Baralzon Lake, lat. 60° N., where it was collected in 1950 on dry rocky barrens and hillocks by the writer and W. Baldwin. First report: the present publication.

Arctic circumpolar (incl. subsp. *obovata* (Fr. Schm.) Hult.): in Alaska, Yukon, and e. Asia, ssp. *obovata*; the main form from Coronation Gulf to to north-central Baffin I., n. Que., n. Lab., and Nfld., s. to n. Man., James Bay, and n. N.E.; Greenland; Iceland; n. Eurasia. A map of the American distribution of the main form is given by Porsild [1955, fig. 16, p. 51].

# 89. PRIMULACEAE

## (Primrose Family)

1. Plants scapose, the leaves in a basal rosette; flowers in terminal umbels.
  2. Corolla pink-purple to almost white, its lobes 10-15 mm. long, reflexed; anthers 6-7 mm. long, forming an exserted cone.......................................1. *Dodecatheon*
  2. Corolla-lobes spreading or ascending; stamens distinct, included.
    3. Corolla-tube equalling or exceeding the calyx, open at throat; style filiform, elongate ..........................................................................2. *Primula*
    3. Corolla-tube shorter than the calyx, its throat constricted; style very short........ ..........................................................................3. *Androsace*
1. Plants with leafy stems; flowers axillary or racemose.
  4. Leaves linear to narrowly oblong, fleshy, 3-12 mm. long, opposite; flowers solitary and sessile in the leaf axils; plant of salt marshes and alkaline habitats..........4. *Glaux*
  4. Leaves broader and longer, not fleshy.
    5. Stem with scale-like alternate leaves below and a single terminal whorl of large ones; flowers white, mostly 7-parted, slender-peduncled in the axils of the upper leaves.................................................5. *Trientalis*
    5. Stem leafy throughout, the leaves mostly opposite or whorled; calyx and yellow corolla 5-6-parted; flowers axillary or racemose.
      6. Flowers short-pedicelled in dense axillary spike-like racemes; corolla-lobes linear; stamens long-exserted; leaves sessile..........................6. *Naumburgia*
      6. Flowers long-pedicelled; corolla-lobes narrowly elliptic to oval, longer than the stamens.
        7. Flowers in a terminal bracted raceme; corolla-lobes entire; filaments united at base; leaves sessile or nearly so..........................7. *Lysimachia*
        7. Flowers axillary; corolla-lobes erose-dentate and cuspidate-tipped; filaments distinct; leaves petioled......................................8. *Steironema*

### 1. Dodecatheon L.

**1. D. media** L. Shooting-star

Prairie, meadows, and clearings of southern Manitoba. Northernmost collection: Eriksdale, about 60 miles north of Portage la Prairie, grassy meadow (Scoggan, 1951). Earliest collection seen: Inwood, about 40 miles north-northwest of Winnipeg (Dudley, 1929). First report: near Turtle Mountain, prairie [Dawson, 1875]. The report of the species from Warren Landing by Lowe [1920, 1943] is referable to *Primula mistassinica*.

Temperate eastern American: s. Man. to Wisc. and w. Pa., s. to Tex. and n. Ga. Maps of the distribution, on which the occurrence of the species in Manitoba should be indicated, are given by Fassett [Amer. Midland Nat. 31: 460 (map 1). 1944] and Thompson [Contrib. Dudley Herb. 4. 117 (fig. 12b). 1953].

### 2. Primula L.

### (Primrose)

[*See* Fernald, 1928.]

1. Leaves entire or merely undulate, mostly shorter than the slender petioles; mature capsules slender-cylindric, two to three times as long as the calyx, the latter with finely glandular-ciliate lobes; plant green throughout......................1. *P. egaliksensis*
1. Leaves more or less toothed, rather short-petioled or merely narrowed at base; mature capsules generally broader.

2. Scape slender, 0.3-1·4 mm. broad below the inflorescence; pedicels filiform, much exceeding the bracts, the latter linear-subulate, commonly not saccate at base; capsules subcylindric, once-and-a-half to twice as long as the calyx, their seeds rounded and nearly smooth; plant mostly efarinose........................*2. P. mistassinica*
2. Scapes stouter, 1-2 mm. broad below the inflorescence; pedicels not more than twice as long as the bracts, these commonly saccate at base; capsules ellipsoid, only slightly exceeding the calyx, their seeds more or less angled and conspicuously reticulated.
    3. Involucral bracts lance-subulate, commonly saccate at base; leaves green or only sparingly farinose beneath; calyx and scape efarinose.................3. *P. stricta*
    3. Involucral bracts lanceolate to linear-oblong, broadly gibbous at base; leaves strongly farinose beneath; calyx and summit of scape strongly farinose..........................................................................4. *P. incana*

1. **P. egaliksensis** Wormsk. Greenland Primrose

Meadows and shores in the northern third of the province. Northernmost collection: Churchill (several collections, the earliest evidently by Macoun in 1910). Southernmost collection: Gillam, about 165 miles south of Churchill, wet bank by Kettle Rapids (Schofield, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: Churchill [Fernald, 1928].

(Arctic-)subarctic American: n. Alaska to Coronation Gulf, s. Keewatin, n. Que., n. Lab., and Nfld., s. to central B.C., s. Alta., n. Man., James Bay, and Anticosti I., Que.; w. and s. Greenland.

Forma *violacea* Fern., with expanded portion of corolla violet or deep lilac, rather than white, occurs with the main form.

2. **P. mistassinica** Michx. (*P. maccalliana* Wieg.) Bird's-eye-Primrose

Wet ground and sandy or rocky shores almost throughout the province except the northeastern Barren Grounds. Northernmost collection seen: York Factory (McTavish, 1854; Scoggan, 1949, gravel beach); but reported from Churchill River by Bell [1880] and from Churchill River between Southern Indian Lake and the mouth of Little Churchill River by Alcock [1916]. Earliest collection seen: York Factory (McTavish, 1854). First report: Churchill River [Bell, 1880].

Subarctic American: central Alaska to n. Man., James Bay, s. Lab., and Nfld., s. to s. B.C., s. Alta., Ia., and Me.

Forma *leucantha* Fern., with white corolla, has been collected at The Pas (Krivda, 1950, lake shore).

3. **P. stricta** Hornem. (*P. farinosa* L. var. *stricta* (Hornem.) Wahl.)

Moist ground and shores in the northern third of the province. Northernmost collection: Churchill (several collections, the earliest seen being an undated one made by Richardson, presumably during the Franklin expeditions of 1819–22; the earliest dated specimen seen from that locality is one made by Macoun in 1910). Southernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: York Factory (McTavish, 1854). First report: between York Factory and Churchill [Rae, 1850; as *P. hornemannia* Lehm.].

Arctic amphi-Atlantic: n. coast of Yukon and Mack., Victoria I., n. Que., and n. Lab., s. to sw. Alaska, n. Man., James Bay, and s. Lab.; southern half of Greenland; Iceland; n. Europe.

4. **P. incana** Jones (*P. farinosa* L. var. *incana* (Jones) Fern.)

Moist ground and shores almost throughout the province except the extreme north. Northernmost collection seen: York Factory (McTavish, 1854; Scoggan, 1949, open ground). Earliest collection seen: York Factory (McTavish, 1854). First report: the present publication. Basis of the citation of *P. farinosa* L. from Solsgirth, about 60 miles northwest of Brandon, by Jackson *et al.* [1922], and from Solsgirth and Riding Mountain by Lowe [1943], and, with *P. stricta*, basis of other citations of *P. farinosa* from the province.

Subarctic American: south-central Alaska to n. Man., James Bay, and nw. Que., s. to Utah, Colo., and s. Man.

### 3. ANDROSACE L.

[*See* St. John, 1922.]

1. Bracts subtending umbel broad and leaf-like, oblanceolate to oblong, up to 6 mm. long; calyx-lobes about equalling the tube .......... 1. *A. occidentalis*
1. Bracts subulate to narrowly lanceolate, 1-3 mm. long; calyx-lobes about half the length of the tube.
    2. Scapes 1-few, erect or ascending, 1-3-dm. tall; plant essentially glabrous .......... 2. *A. septentrionalis*
    2. Scapes usually numerous and diffuse, mostly less than 1 dm. tall; plant minutely stellate-pubescent, at least in the inflorescence .......... 2a. *A. septentrionalis* var. *puberulenta*

1. **A. occidentalis** Pursh

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Roblin, south of Duck Mountain (Simpson, 1938). Earliest collection seen: Brandon, cultivated ground (Macoun, 1896). First report: foot of Pembina Mountain, south of Portage la Prairie [Dawson, 1875].

Temperate western American: B.C. to w. Ont., s. to Ariz., Tex., Ark., and Ind.

2. **A. septentrionalis** L. (Incl. var. *robusta* St. John)

Sandy or gravelly open ground in the northern third of the province. Northernmost collection: Churchill (several collections, the earliest seen being made by Macoun in 1910). Southernmost collection: Gillam, about 165 miles south of Churchill, sandy railroad yard (Schofield, 1950). More southerly citations of the main form appear to be all referable to the following variety. Earliest collection seen: Churchill (Macoun, 1910). First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Ellesmereland), n. Que., and Nfld., s. to N.M., s. Man., James Bay, and e. Que.; n. Eurasia.

2a. **A. septentrionalis** var. **puberulenta** (Rydb.) Knuth (*A. puberulenta* Rydb.)

Dry prairie, sandhills, and rock outcrops in the southern half of the province. Northernmost collection: Norway House, off the northeast end of Lake Winnipeg, granite outcrop (Scoggan, 1948, 1949). Earliest collection seen: Carberry, open prairie (Macoun, 1884). First report: Jackson *et al.* [1922]. Basis of citations of *A. diffusa* Small (*A. septentrionalis* var. *diffusa* (Small) Knuth) from Carberry and Riding Mountain by Lowe [1943], and probable basis of the listing of *A. subumbellata* (Nels.) Small (*A. septentrionalis* var. *subumbellata* Nels.) by Jackson *et al.* [1922] and Lowe [1943].

Temperate western American: B.C. to Man., s. to Ariz., N.M., and S.D.

### 4. GLAUX L.

(Sea-Milkwort)

1. **G. maritima** L.

Alkaline soil and salt marshes in the southern two-fifths of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, salt flat near mouth of Red Deer River (Scoggan, 1948; Scoggan & Baldwin, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, low open prairie (Burgess, 1873). First report: Red River prairie [Dawson, 1875].

Subarctic circumpolar: sw. Alaska to central Mack. and south-central Man., s. to Oreg. and N.M.; e. Que. to Va.; Eurasia.

### 5. TRIENTALIS L.

1. **T. borealis** Raf. (*T. americana* Pursh) Star-flower

Woods and thickets throughout the province except the extreme north and the southwestern prairie region. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., black spruce woods (Baldwin, 1951). Earliest collection seen: Lake Manitoba, damp woods (Macoun, 1881). First report: north end of Lake Winnipeg [Bell, 1880].

(Arctic-)subarctic American: n. Alta. to n. Lab. and Nfld., s. to central Alta., Minn., and Va.

Forma *pluriverticillata* Vict. & Rolland, with 2 or 3 whorls of somewhat reduced leaves, in addition to the normal whorl, was collected in 1949 by the writer along a gravel roadside near Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas.

### 6. NAUMBURGIA Moench

1. **N. thyrsiflora** (L.) Duby (*Lysimachia thyrsiflora* L.) Tufted Loosestrife

Wet ground and shallow water throughout the province except the extreme north. Northernmost collection: Reindeer Lake, lat. 57° 37′ N., silted shore (Baldwin, 1951). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open swamp (Burgess, 1873). First report: Red River [Dawson, 1875].

Subarctic circumpolar: central Alaska to n. Man., James Bay, and e. Que., s. to Calif., Colo., Mo., and W. Va.; Eurasia.

## 7. LYSIMACHIA L.

(Loosestrife)

1. **L. terrestris** (L.) BSP. Yellow Loosestrife

Specimens have been seen from the following localities: Caddy Lake, Whiteshell Forest Reserve east of Winnipeg (Simpson, 1934; Leach, 1939); Winnipeg, ditch (Denike, 1940); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, rocky shore (Breitung, 1949). First report: Jackson *et al.* [1922].

(Subarctic-)temperate eastern American: se. Man. to James Bay and Nfld., s. to Ia., Ky., and Ga.

## 8. STEIRONEMA Raf.

1. Petioles long, ciliate-fringed; leaves broadly rounded to subcordate at base; calyx-segments obscurely nerved; stem from a slender rhizome................1. *S. ciliatum*
1. Petioles short, rarely ciliate; leaves usually narrowed to base; calyx-segments 3(-5)-nerved; rhizomes wanting.........................................2. *S. hybridum*

1. **S. ciliatum** (L.) Raf. (*S. pumilum* Greene; *Lysimachia ciliata* L.)

Damp thickets and woods in the southern half of the province. Northernmost collection: Hill Lake, north of Lake Winnipeg, limestone shingle shore (Scoggan, 1948). Earliest collection seen: Fort Garry and Assiniboine River (Schultz, 1861). First report: Turtle Mountain and Red River prairie [Dawson, 1875].

Temperate American: B.C. to Que., s. to Colo., Tex., and Fla.

2. **S. hybridum** (Michx.) Raf. (*Lysimachia hybrida* Michx.)

Specimens have been seen from the following localities: Portage la Prairie (McMorine, 1897); Macgregor, low ground (Hales, 1900); 10 miles north of Brandon, moist ditch (Scoggan, 1953). First report: the present publication.

Temperate eastern American: s. Man. to sw. Que., s. to Tex., Miss., and Fla.

*S. quadriflorum* (Sims) Hitchc. (*Lysimachia quadriflora* Sims) is reported from Foxwarren, about 70 miles northwest of Brandon, by Lowe [1943], but the specimen concerned (Laycup, 1923) is referable to *Gratiola neglecta* Torr. It is also reported (as *S. longifolium* Gray) from "Lake Winnipeg to Niagara" by Macoun [1884], this latter probably based upon the citation of *Lysimachia longifolia* Pursh from Winnipeg by Bourgeau [in Palliser, 1863]. In the absence of supporting specimens, it should be excluded from our flora for the present.

### *Centunculus* L.

*C. minimus* L., Chaffweed, a low annual herb with minute pink flowers subsessile in the axils of the mostly alternate leaves, is listed by Burman [1910] and Jackson *et al.* [1922], and is cited from Rossburn by Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora for the present.

## 90. OLEACEAE

## (Olive Family)

### 1. FRAXINUS L.

### (Ash)

1. Calyx wanting; fruits linear-oblong or narrowly elliptical, blunt at both ends, winged to base; leaflets 7-11, the lateral ones sessile; branchlets glabrous..............1. *F. nigra*
1. Calyx present; fruits tapering below, only the upper half winged; leaflets 5-9, on short winged petiolules.
   2. Branchlets velvety-tomentose; petioles and leaf-rachises pubescent.................................................................2. *F. pennsylvanica* var. *austini*
   2. Branchlets, petioles, and leaf-rachises glabrous..........................................................................2a. *F. pennsylvanica* var. *subintegerrima*

1. **F. nigra** Marsh. Black Ash

Specimens have been seen from the following localities: Sprague, about 85 miles southeast of Winnipeg, woods (Scoggan, 1953); Whiteshell Forest Reserve, east of Winnipeg, rocky woods (Scoggan, 1951); Seven Sisters Falls, about 50 miles northeast of Winnipeg, rich woods (Scoggan, 1951); Grand Beach, near the southeast end of Lake Winnipeg, wet woods (Breitung, 1949); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, wet swampy ground (Breitung, 1949); Gimli, about 45 miles north of Winnipeg (Dudley, 1941). First report: Grand Beach and Gimli [Jackson *et al.* 1922].

(Subarctic-)temperate eastern American: e. Man. to Nfld., s. to N.D., Ia., and Va. A map of the area is given by Munns [1938], and one of the greater part of the distribution is given by the Dominion Forest Service [1949, p. 276].

2. **F. pennsylvanica** Marsh. var. **austini** Fern.

Woods in the southern two-fifths of the province. Northernmost collection: The Pas, along Saskatchewan River (Krivda, 1953). Earliest collection seen: Black River, near the southeast end of Lake Winnipeg, rich moist woods (Macoun, 1884). First report: "Manĭtoba" included in the range given by Fernald [Rhodora 40: 452. 1938]. Probable basis of the report of *F. pubescens* Lam. westward to Red Deer River and in the valleys of the Red and Assiniboine rivers by Macoun [1884].

Temperate eastern American: e. Sask. to Que., s. to Ia. and Va.

2a. **F. pennsylvanica** var. **subintegerrima** (Vahl) Fern. (var. *lanceolata* (Borkh.) Sarg.; *F. viridis* Michx. f.) Red Ash

Woods in the southern quarter of the province. Northernmost collection: Hecla Island, Lake Winnipeg, limestone substratum (Scoggan, 1951); but noted by the writer as far north as Sagemace Bay, near the south end of Lake Winnipegosis. It is reported as far north as The Pas by Stevenson [1938], but this may be referable to the above variety, which is the only one the writer has seen from that locality. Earliest collection seen: "L.

Winipeg Valley" (Bourgeau, 1857). First report: Winnipeg [Bourgeau, in Palliser, 1863; *F. viridis*]. Basis of most reports of the main form from the province.

Temperate American: se. Alta. to Que., s. to Tex. and Ga. A map of the area is given by Munns [1938], and one of the greater part of the distribution is given by the Dominion Forest Service [1949, p. 282].

*F. campestris* Britt., cited by Lowe [1943] from Killarney, Tiger Hills south of Brandon, Turtle Mountain, and Souris Valley, is considered by Fernald [Rhodora 40: 453. 1938] to be merely a state intermediate between the above two varieties of *F. pennsylvanica*.

## 91. GENTIANACEAE

### (Gentian Family)

1. Leaves basal, 3-foliolate, the leaflets oblong or obovate; rootstock thick and scaly; flowers white; plant of shallow water and pond-margins................1. *Menyanthes*
1. Leaves opposite on the stem, simple; plants of drier habitats.
   2. Corolla-lobes greenish or bronze, prolonged at base into spurs, these nectiferous at the bottom.........................................................2. *Halenia*
   2. Corolla-lobes spurless; flowers blue.
      3. Corolla wheel-shaped, it and the calyx deeply 4-5-parted; stamens borne on base of corolla; plant of the Hudson Bay shore........................3. *Lomatogonium*
      3. Corolla tubular or bell-shaped, with ascending or spreading lobes; stamens borne on corolla-tube...............................................4. *Gentiana*

### 1. MENYANTHES L.

1. **M. trifoliata** L. Buckbean. Bogbean

Swampy ground and shallow water throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first seen being made by Polunin in 1936). Earliest collection seen: York Factory (McTavish, 1854). First report: Churchill River [Bell, 1880].

Subarctic circumpolar: n. Alaska to central Keewatin, n. Que., central Lab., and Nfld., s. to Wyo., Mo., and Del; sw. Greenland; Iceland; Eurasia. According to Fernald [Rhodora 31: 195-198. 1929], the eastern American plant forms a good geographical race, var. *minor* Michx.

### 2. HALENIA Borkh.

1. **H. deflexa** (Sm.) Griseb. Spurred Gentian

Damp woods and thickets in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, trail through woods (Scoggan, 1948). Earliest collection seen: Lake of the Woods, Man. (Burgess, 1873). First report: Lake of the Woods [Dawson, 1875].

(Subarctic-)temperate American: s. B.C. to s. Lab. and Nfld., s. to n. Mont., S.D., Mich., and N.E.

## 3. LOMATOGONIUM A. Br.

1. **L. rotatum** (L.) Fries (*Pleurogyne rotata* (L.) Griseb.; *P. carinthiaca* var. *pusilla* (Pursh) Gray)

Specimens have been seen from the following localities only: York Factory (McTavish, 1854); Churchill (several collections, the earliest seen being made by Macoun in 1910). First report: near York Factory ["H", Richardson, in Franklin, 1823; as *Gentiana rotata*].

Arctic circumpolar (with large gaps): n. Alaska and n. coast of Yukon and Mack., Victoria I., n. Que., n. Lab., and Nfld., s. to Colo., south-central Sask. (f. *tenuifolium* (Griseb.) Fern.), James Bay, e. Que., and Me.; sw. Greenland; Iceland; n. Eurasia. Maps of the circumpolar distribution are given by Fernald [1925, map 67, p. 339; 1929, map 19, p. 1497].

## 4. GENTIANA L.

### (Gentian)

1. Flowers 4-merous (or often 5-merous in *G. amarella*), mostly long-stalked and without basal bracts; corolla without plaits or teeth in the sinuses; annuals or biennials.
  2. Flowers small, the corolla 1-2 cm. long, its lobes acute; calyx 3-13 mm. long, cleft about three-fourths to base.
    3. Corolla-lobes bristle-tipped, not fringed within at base; plant of the Hudson Bay region . . . . . . . . 1. *G. propinqua*
    3. Corolla-lobes strongly fringed within at base, not bristle-tipped . . . . . 2. *G. amarella*
  2. Flowers larger, the corolla 2-6 cm. long, its rounded lobes fringed or erose-toothed; calyx 1·5-4·5 cm. long, cleft about half-way to base.
    4. Corolla 3·5-6 cm. long, the upper half of its lobes with a fringe 2-6 mm. long; capsule distinctly stalked; upper leaves ovate-lanceolate to ovate, rounded or subcordate at base . . . . . . . . 3. *G. crinita*
    4. Corolla 2-5·5 cm. long, its lobes often long-fringed below, but merely with short triangular teeth less than 2 mm. long above; capsule subsessile or with a short thick stalk; upper leaves linear-lanceolate.
      5. Calyx 1·5-2·5 cm. long, its keels merely granulose-roughened; corolla 2·3-4 cm. long, its finally suberect lobes with few slender marginal teeth 1-2 mm. long; leaves 2-8 pairs below the primary peduncle . . . . . . . . 4. *G. macounii*
      5. Calyx 1·5-4·5 cm. long, its keel strongly papillose-scabrous; corolla 2-5·5 cm. long, its finally spreading-ascending lobes fringed on the sides with slender teeth 2-4 mm. long; leaves 8-13 pairs below the primary peduncle . . . . . . . . 5. *G. procera*
1. Flowers 5-merous, sessile or very short-peduncled, with 1 or 2 basal bracts; corolla with membranous tooth or lobed plaits in the sinuses; perennials.
  6. Anthers free or promptly separating; leaves firm, mostly 1·5-5 cm. long.
    7. Leaves 7-13 pairs below the inflorescence; calyx-tube 5-7 mm. long, the lobes unequal; corolla 2-3 cm. long, its lobes not much longer than the laciniate appendages . . . . . . . . 6. *G. affinis*
    7. Leaves 13-19 pairs below the inflorescence; calyx-tube about 1 cm. long, its lobes subequal; corolla 3·5-5 cm. long, its lobes twice as long as the 2-cleft appendages . . . . . . . . 7. *G. puberula*
  6. Anthers often cohering in a ring; leaves mostly softer and longer.
    8. Corolla nearly truncate at summit, the firm true lobes nearly obsolete; calyx-lobes distinctly ciliate . . . . . . . . 8. *G. andrewsii*
    8. Corolla with broad rounded lobes much longer than the intervening sinuses; calyx-lobes smooth-margined or at most scabrous.
      9. Corolla yellowish-white or greenish; calyx with narrow acute sinuses, the ovate to cordate lobes spreading or reflexed . . . . . . . . 9. *G. flavida*
      9. Corolla blue-violet; calyx with broad rectangular sinuses and linear to oblong lobes . . . . . . . . 10. *G. linearis*

1. **G. propinqua** Richards. (*Amarella propinqua* (Richards.) Greene)

Specimens have been seen from the following localities only: York Factory (Bell, 1880, damp places; Scoggan, 1949, gravel-cobble beach of Hay Island); Churchill (several collections, the earliest seen being made by Bell in 1884). First report: near York Factory ["H", Richardson, in Franklin, 1823].

(Arctic-)subarctic American: n. Alaska and n. coast of Yukon and Mack. to n. Man., s. to B.C., James Bay, e. Que., and Nfld.; ne. Asia. A map of the American distribution is given by Raup [1947, pl. XXXIII].

2. **G. amarella** L. (*G. acuta* Michx.; *G. amarella* var. *acuta* (Michx.) Herder; *Amarella acuta* (Michx.) Raf.) [*See* Fernald, Rhodora 19: 149-151. 1917.] Felwort

Low open ground in the southern three-quarters of the province. Northernmost collection seen: York Factory (McTavish, 1854). Reported also from Churchill River by Alcock [1916], but no specimen has been seen from that locality, and the citation may be referable to the foregoing species. Earliest collection seen: the above York Factory specimen. First report: Fort Garry [Schultz, 1861]. Basis of reports of *G. amarella* var. *stricta* Wats. from the province.

Subarctic American: central Alaska to north-central Man., n. Que., and Nfld., s. to Calif., N.M., S.D., and Vt.; s. Greenland.

Forma *michauxiana* Fern., with creamy-white corolla, occurs at various localities in the southern part of the province.

3. **G. crinita** Froel. (*Anthopogon crinitus* (Froel.) Raf.) Fringed Gentian

Meadows and damp thickets in the southern two-fifths of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg (Anderson, 1850; Jackson, 1925; Scoggan, 1948). Earliest collection seen: the foregoing Anderson collection from Grand Rapids. First report: Fort Garry [Schultz, 1861].

Temperate eastern American: e. Sask. to Ont. and Me., s. to n. Ia., O., and Ga.

4. **G. macounii** Holm (*Anthopogon macounii* (Holm) Rydb.)

Low ground in the southern two-fifths of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg (Jackson, 1925; Scoggan, 1948, swampy ground and cobble beach). Earliest collection seen: Aweme, about 20 miles southeast of Brandon (White, 1922). First report: the present publication. Basis of the citation of *G. tonsus* (Lunell) Vict. (*Anthopogon tonsus* (Lunell) Rydb.) from Ochre River by Lowe [1943], and probable basis of the listing of *G. serrata* Gunn. by Burman [1910], and its citations from near Carberry and the Assiniboine River by Christy [1887].

(Subarctic-)temperate American: sw. Yukon to central Alta. and s. James Bay, s. to Mont., N.D., and Ia.

5. **G. procera** Holm (*Anthopogon procerus* (Holm) Rydb.)

Specimens have been seen from the following localities: Stony Mountain near Winnipeg (Macoun, 1896, swampy ground); Sifton, west of Dauphin Lake (Krivda, 1948); Ochre River, south of Dauphin Lake, meadow (Scoggan, 1951). The citations from Aweme, Inwood, and Grand Rapids by Lowe [1943] are referable to *G. macounii.* The Riding Mountain specimen was not seen. First report: Stony Mountain [Holm, Ott. Nat. 15: 111. 1901].

Subarctic American: south-central Alaska and south-central Yukon [*see* Porsild, Rhodora 41: 279-280. 1939] to s. Ont., s. to N.D. and O.

6. **G. affinis** Griseb. (*Dasystephana affinis* (Griseb.) Rydb.)

Low open ground of southern Manitoba. Northernmost collection (apart from a collection made at Churchill in 1931 by Mrs. E. J. MacMillan, that appears to be referable here): Shoal Lake, about 50 miles northwest of Brandon, moist grassland (Scoggan, 1951). Earliest collection seen: Fort Garry, plains (Macoun, 1872). First report: near Carberry, prairie [Christy, 1887].

Subarctic American: nw. Mack. to Man., s. to Calif., Colo., and S.D.

7. **G. puberula** Michx. (*Dasystephana puberula* (Michx.) Small)

Specimens have been seen from the following localities: Winnipeg (Fowler, 1939); Stony Mountain, near Winnipeg (Groh, 1922); Stonewall, about 15 miles northwest of Winnipeg (Simpson, 1937); Cypress River, about 40 miles southeast of Brandon (Denike, 1897); Brandon (Fletcher, 1895); McCreary, east of Riding Mountain (Mrs. J. May, 1943). First report: prairie west of Red River [Dawson, 1875].

Temperate eastern American: s. Man. to s. Ont. and N.Y., s. to Kans. and Ga.

8. **G. andrewsii** Griseb. (*Dasystephana andrewsii* (Griseb.) Small) Closed Gentian

Meadows and damp thickets in the southern third of the province. Northernmost collection: Dauphin, north of Riding Mountain, moist grassland (Scoggan, 1951). Earliest collection seen: Selkirk, northeast of Winnipeg, rich moist ground (Macoun, 1884). First report: Dufferin, near Carman, about 45 miles southwest of Winnipeg [Dawson, 1875].

Temperate eastern American: se. Sask. to sw. Que. and Mass., s. to Ark. and Ga.

Forma *albiflora* Britt., with white corolla, has been collected at Winnipeg (Lowe, 1934; Simpson, 1934).

9. **G. flavida** Gray (*G. alba* Muhl.; *Dasystephana flavida* (Gray) Britt.) Yellowish Gentian

A single specimen has been seen, from south of Winnipeg (Lyons, 1947). Reported also from Brereton, Riding Mountain, and Swan Lake by Lowe

[1943]. No specimens have been seen from these localities, however, and the uncompleted note under *G. flavida* appears to be an accidental transposition of the first line under *Halenia deflexa*. First report: Burman [1910; *G. alba*].

Temperate eastern American: s. Man. to s. Ont. and Pa., s. to Ark. and N.C.

10. **G. linearis** Froel. (*Dasystephana linearis* (Froel.) Britt.; incl. var. *latifolia* Gray (*G. rubricaulis* Schw.; *G. grayi* Kusnez.)) Closed Gentian

Specimens have been seen from the following localities: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1921); Winnipeg (Fowler, 1939; Green, 1947); Morden, about 60 miles southwest of Winnipeg (de Ruyck, 1943); Riding Mountain (Fowler, 1938). First report: Victoria Beach, Waugh, and Churchill [Lowe, 1943]; but the Churchill specimen (MacMillan, 1931) is referable to *G. affinis.*

(Subarctic-)temperate eastern American: s. Man. to James Bay and s. Lab., s. to Neb., Minn., Pa., and Md.

*G. ventricosa* Griseb.: a peculiar greenish-yellow-flowered plant was collected at Grand Rapids, near the northwest end of Lake Winnipeg (Scoggan, No. 4407, August 6, 1948; "woods and clearings along old Hudson's Bay Co. tramway portage"). The specimen is annotated by J. M. Gillett as very similar to the plant described in Hooker [1838, p. 65] from "Grand Rapids of the Saskatchewan", and is believed by him to be merely a genetic oddity and not a distinct species. From the floral structure, Hooker thought it nearest to *G. detonsa* Fries. The latter species was reported by Bell [1881] from York Factory, but the specimen involved has not been seen.

## 92. APOCYNACEAE

## (Dogbane Family)

### 1. Apocynum L.

### (Dogbane)

1. Corolla pink or pink-striped, 4-9 mm. long, bell-shaped, with more or less spreading or reflexed lobes; leaves reflexed or wide-spreading.
  2. Lobes of corolla soon recurving; cymes both terminal and lateral, flowering simultaneously, the flowers 6-9 mm. long, soon nodding..............1. *A. androsaemifolium*
  2. Lobes of corolla not recurving; cymes terminal, the central one flowering much earlier than the others; flowers 4-7 mm. long, ascending or spreading...........*A. medium*
1. Corolla greenish-white, tubular to ovoid; leaves ascending or wide-spreading.
  3. Leaves of main stem mostly definitely petioled; mature fruits 12-20 cm. long, curved; small bracts of inflorescence scarious; coma of seed 2·5-3 cm. long....................2. *A. cannabinum*
  3. Leaves of main stem sessile or nearly so; mature fruits 4-10 cm. long, straightish; small bracts of inflorescence green and herbaceous; coma of seed 0·8-2 cm. long.
    4. Corolla about as broad as long; coma of seeds 8-12 mm. long.
      5. Leaves of main stem rounded to cordate at base................3. *A. sibiricum*
      5. Leaves of main stem deeply cordate and clasping....................3a. *A. sibiricum* var. *cordigerum*
    4. Corolla distinctly longer than broad; coma of seeds 15-20 mm. long....................3b. *A. sibiricum* var. *salignum*

1. **A. androsaemifolium** L. (Incl. var. *incanum* A. DC. and var. *glabrum* Macoun (*A. scopulorum* Greene)) Spreading Dogbane

Open woods, thickets, rock outcrops, and clearings in the southern two-thirds of the province. Northernmost collection seen: Gillam, about 165 miles south of Churchill (Schofield, 1950); but reported from York Factory by Bell [1881]. Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Winnipeg [Bourgeau, in Palliser, 1863].

Subarctic American: central Alaska to north-central Man., s. Lab., and Nfld., s. to n. Mex., Ariz., Tex., and Ga. A map of the distribution is given by Woodson [1930, p. 175].

*A. medium* Greene: A specimen from Birds Hill, near Winnipeg (Denike, 1939; in herbarium of the Division of Botany, Department of Agriculture, Ottawa) is placed here by M. N. Zinck. In view of the close similarity between this and the preceding species, it is not felt advisable to admit it to our flora at the present time.

2. **A. cannabinum** L. (Incl. var. *glaberrimum* A. DC.) Indian Hemp

Thickets and prairie of southern Manitoba. Northernmost collection: Brandon, banks of Assiniboine River (Macoun, 1896). Earliest collection seen: the foregoing Brandon specimen. First report: Burman [1910].

Temperate American: Alta. to w. Que., s. to Calif. and Fla. A map of the distribution is given by Woodson [1930, p. 175].

3. **A. sibiricum** Jacq. (*A. hypericifolium* Ait.)

Thickets, prairie, sandhills, and clearings of southern Manitoba. Northernmost collection: Selkirk, northeast of Winnipeg, grassland (Scoggan, 1951). Earliest collection seen: Souris Co. (Walker, 1889). First report: Winnipeg [Bourgeau, in Palliser, 1863].

(Subarctic-)temperate American: sw. Mack. to James Bay, e. Que., and Nfld., s. to Tex., O., and Va. A map of the distribution is given by Woodson [1930, p. 175; *A. cannabinum* var. *hypericifolium*].

3a. **A. sibiricum** var. **cordigerum** (Greene) Fern. (*A. cordigerum* Greene)

Similar habitats and distribution in the province as the main form, and scarcely distinct from it. Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857; specimen, in Gray Herbarium of Harvard University, determined by Fernald). First report: the present publication.

Temperate eastern American: s. Man. to N.E., s. to Kans. and O.; reported also from Sask. A map of the distribution, on which the occurrence of the variety in Manitoba should be indicated, is given by Woodson [1930, p. 175].

3b. **A. sibiricum** var. **salignum** (Greene) Fernald (*A. salignum* Greene)

A single specimen has been seen, from Brandon, where it was collected by Macoun in 1896. First report: Brandon [Woodson, Ann. Mo. Bot. Gard. 17: 142. 1930].

Temperate western American: s. B.C. to s. Man., s. to Calif. and Tex. A map of the distribution is given by Woodson [1930, p. 185].

## 93. ASCLEPIADACEAE

### (Milkweed Family)

### 1. ASCLEPIAS L.

### (Milkweed)

1. Corona-hoods unappendaged; flowers greenish; umbels mostly lateral, subsessile.
2. Leaves oval or oblong, obtuse or merely short-tipped................1. *A. viridiflora*
2. Leaves narrower, acute or acuminate.
3. Leaves lanceolate to narrowly ovate, mostly 1·5-4·5 cm. broad..........................................................1a. *A. viridiflora* var. *lanceolata*
3. Leaves narrowly linear to linear-lanceolate, 2-10 mm. broad..........................................................1b. *A. viridiflora* var. *linearis*

1. Corona-hoods each with an incurved horn within; umbels terminal or lateral, peduncled.
4. Leaves narrowly linear, with revolute margins, in whorls of 3-6; umbels small; flowers greenish-white..........................................................2. *A. verticillata*
4. Leaves broader, opposite; umbels relatively large.
5. Leaves essentially glabrous; flowers red or rose-purple; fruiting pedicels erect..........................................................3. *A. incarnata*
5. Leaves pubescent, at least beneath; flowers yellowish or merely purple-tinged; follicles erect on recurving or reflexed pedicels.
6. Corona-hoods 1-1·5 cm. high, their summits prolonged into a tongue-like appendage; pedicels, bracts, and top of stem densely white-tomentose; follicles softly spiny; leaves often subcordate at base, with strong transverse veins..........................................................4. *A. speciosa*
6. Corona-hoods smaller, unappendaged; pedicels, etc., less densely pubescent; leaves narrowed to rounded at base.
7. Leaves soft-downy beneath, with slender ascending veins; peduncles short; surface of follicle plane..........................................................5. *A. ovalifolia*
7. Leaves minutely greyish-tomentose beneath, with strong transverse veins; peduncles 2·5-5 cm. long; follicles softly spiny..................6. *A. syriaca*

1. **A. viridiflora** Raf. (*Acerates viridiflora* (Raf.) Eaton) Green Milkweed

Dry prairie and sandhills of southern Manitoba. Specimens have been seen from the following localities: Oak Lake Indian Reserve, about 40 miles west of Brandon, dry prairie (Scoggan, 1953); mouth of Qu'Appelle River, at St. Lazare, about 75 miles northwest of Brandon (Macoun & Herriot, 1906). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Temperate American: s. Sask. to s. Ont. and Pa., s. to N.M., Tex., and Fla.

1a. **A. viridiflora** var. **lanceolata** (Ives) Torr.

Similar habitats and distribution in the province; more common than the main form. Specimens have been seen from the following localities: Stockton, about 30 miles southeast of Brandon (Bird, 1949); Aweme, about 20 miles southeast of Brandon (Criddle, 1926); Camp Hughes, east of Brandon (Bird, 1949); Oak Lake, about 30 miles west of Brandon (Scoggan, 1951, sandhills; 1953, dry prairie); Routledge, about 40 miles west of Brandon, sandhills (Scoggan, 1953); mouth of Qu'Appelle River, at St. Lazare, about 75 miles northwest of Brandon (Macoun & Herriot, 1906; Scoggan, 1951, 1953, sandhills). First report (with citation of localities): the present publication; but accredited to Manitoba in the range given by

Fernald [1950]. Probable basis of the inclusion of *Acerates lanuginosa* (Nutt.) DC. by Lowe [1943], and of the report of *A. tuberosa* L. from sand dunes near Carberry by Shimek [1927].

Temperate American: Wyo. to s. Man., s. Ont., and Pa., s. to N.M., Tex., La., and Pa. Intermediate between the main form and the following variety; Gleason [1952] believes the three forms may be correlated with the dryness of the habitat. Fernald [Rhodora 45: 458. 1943] had already pointed out the difficulty of maintaining var. *lanceolata* as an entity distinct from the main form but accepted it largely because of the very different broad ranges of the two forms.

1b. **A. viridiflora** var. **linearis** (Gray) Fern.

Similar habitats and distribution in the province as the above two forms. Specimens have been seen from the following localities: "Winipeg Valley" (Bourgeau, 1859; probably collected near Brandon); Aweme, about 20 miles southeast of Brandon (Criddle, 1910; Scoggan, 1953, sandy plain); Grande Clarière, near Hartney, about 35 miles southwest of Brandon (Scoggan, 1950, dry sandy prairie); mouth of Qu'Appelle River, about 75 miles northwest of Brandon (Macoun & Herriot, 1906). First report (with citation of specimens): the present publication; but accredited to Manitoba in the range given by Fernald [1950]. Probable basis of the citation of *Acerates angustifolia* (Nutt.) Dcne. (*Asclepias stenophylla* Gray) from St. Lazare in the undated supplement to Lowe's 1943 checklist.

Temperate (interior) American: sw. Man. to w. Ont., s. to N.M., Okla., and La.

2. **A. verticillata** L.

Dry prairie and sterile soil of southern Manitoba. Northernmost collection: vicinity of Winnipeg (several collections, the first by Macoun in 1872). Earliest collection seen: the foregoing Macoun specimen. First report: "Sparingly between Winnipeg and Portage la Prairie" [Macoun, 1884].

Temperate American: s. Sask. to s. Ont. and Mass., s. to Tex., Fla., and Mex.

3. **A. incarnata** L. Swamp-Milkweed

Ditches and swampy ground of southern Manitoba. Northernmost collection: Camper, about 75 miles north of Portage la Prairie, moist ditch. Earliest collection seen: Transcona, about 10 miles east of Winnipeg (Brooks, 1934). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Temperate American: Wyo. to Man. and Que., s. to N.M., Tex., Tenn., and S.C.

4. **A. speciosa** Torr.

Prairie, fields, and open ground in the southern part of the province. Northernmost collection: Ochre River, about 80 miles north of Brandon, moist ground (Scoggan, 1951, 1953). Earliest collection seen: Pembina

Mountain, south of Portage la Prairie, open prairie (Burgess, 1873). First report: "Not rare on the prairie from Manitoba to the Rocky Mountains" [Macoun, 1884].

Temperate western American: B.C. to Man., s. to Calif., Tex., and Mo.

5. **A. ovalifolia** Dcne.

Prairie and open ground in the southern part of the province. Northernmost collection: Fort Ellice, about 70 miles northwest of Brandon (Macoun, 1879). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Winnipeg [Bourgeau, in Palliser, 1863].

Temperate western American: Alta. to s. Man., s. to Neb., Ia., and Ill.

6. **A. syriaca** L. Common Milkweed

Thickets and clearings in the southern part of the province. Northernmost collection: Victoria Beach, about 55 miles north-northeast of Winnipeg (Denike, 1942). Earliest collection seen: Winnipeg (Lowe, 1909). First report: Winnipeg [Bourgeau, in Palliser, 1863; as *A. cornuta* L.].

Temperate eastern American: reported from Sask.; se. Man. to N.B., s. to Kans. and Ga.

## 94. CONVOLVULACEAE

### (Convolvulus Family)

1. Plants with green leaves, these mostly cordate or 2-lobed at base; corolla large and showy, funnel-form........................................1. *Convolvulus*
1. Plants without green leaves, twining and parasitic upon other plants; corolla very small, subglobose to globose-ovoid........................................2. *Cuscuta*

### 1. CONVOLVULUS L.

### (Bindweed)

1. Calyx bractless at base; stigmas filiform; corolla white or reddish-tinged, 1·5-2 cm. long; plant trailing or slightly twining........................................1. *C. arvensis*
1. Calyx enclosed by two large bracts; stigmas oval or oblong.
  2. Stem erect or merely twining at tip; flowers white, 3·5-7 cm. long; basal leaves much reduced; petioles rarely more than half as long as the leaf-blades.....*C. spithamaeus*
  2. Stem twining or trailing; flowers white to roseate, 4-8 cm. long; basal leaves only slightly reduced; petioles longer.
    3. Blade of principal leaves (above the sinus) mostly two-thirds as broad as to broader than long........................................2. *C. sepium*
    3. Blade of principal leaves (above the sinus) rarely half as broad as long.......... ........................................*C. sepium* var. *repens*

1. C. ARVENSIS L. Field-Bindweed

Specimens have been seen from the following localities: near Morden, about 60 miles southwest of Winnipeg (Marshall, 1941; Cranston, 1949, roadside ditch; Frankton, 1949; Dore & Lindsay, 1950, ditch; Scoggan, 1953, roadside); Morris, about 35 miles south-southwest of Winnipeg, open prairie (Macoun, 1896); near Winnipeg (Simpson, 1934; Groh, 1939, roadside). First report: Morden [J. M. Macoun, 1901]. The citation from Churchill by Gardner [1937] is in need of further confirmation.

Eurasian: widely naturalized in temperate North America.

2. **C. sepium** L. (Incl. var. *americanus* Sims (*C. americanus* (Sims) Greene) and var. *repens* (L.) Gray) Hedge-Bindweed. Wild Morning-glory

Prairie, thickets, and clearings in the southern third of the province. Northernmost collection: Porcupine Mountain, dry roadside (Scoggan & Baldwin, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873). First report: Turtle Mountain [Dawson, 1875; as *Calystegia sepium*]. Basis of citations of *C. interior* House from the province.

(Subarctic-)temperate circumpolar: B.C. to Nfld., s. to Oreg., Tex., and Fla.; Eurasia.

*C. spithamaeus* L., Low Bindweed, is cited from Red River by Dawson [1875; as *Calystegia spithamaeus*], from near Aweme by Criddle [1927], and from Winnipeg and Shoal Lake, near the Ontario boundary east of Winnipeg, by Groh & Frankton [1949]. It is also included, but without definite localities, in the checklists of Burman [1910], Jackson *et al.* [1922], and Lowe [1943]. A so-named specimen from near Forrest, north of Brandon (Macoun & Herriot, No. 74,424, 1906) is referable to *C. sepium.* In the apparent absence of supporting specimens, the species should be excluded from our flora for the present.

## 2. CUSCUTA L.

## (Dodder)

[*See* Yuncker, 1932.]

1. Lobes of the corolla acute, with often inflexed tips.
  2. Corolla and calyx 5-parted, the lobes of the latter obtuse at summit; scales (at base of stamens within corolla and alternate with its lobes) abundantly long-fringed; capsule usually depressed-globose, with the withered corolla at its base......1. *C. campestris*
  2. Corolla triangular and acute; scales rudimentary, 2-lobed at summit, merely toothed; capsule at first globose, becoming depressed, the withered corolla, if present, borne about the upper part..........................................2. *C. coryli*
1. Lobes of the corolla (and calyx) obtuse, the corolla-lobes erect to spreading or somewhat reflexed; capsule capped by the withered corolla.
  3. Capsule depressed-globose; calyx and corolla 4-parted; scales short-toothed; stamens barely reaching the sinuses of the corolla.........................3. *C. cephalanthi*
  3. Capsule globose-conic; calyx and corolla 5-parted; stamens overtopping the sinuses.
    4. Scales fringed from base to summit, mostly reaching the base of the stamens; styles two-thirds as long as the capsule...............................4. *C. gronovii*
    4. Scales 2-forked at summit, toothed or short-fringed, much shorter than the corolla-tube; styles about one-fourth as long as the somewhat umbonate or flat-beaked capsule..................................................5. *C. megalocarpa*

1. **C. campestris** Yuncker (*C. arvensis* Beyrich var. *calycina* Engelm.)

Specimens have been seen from the following localities: Morris, about 35 miles south-southwest of Winnipeg (Macoun, 1896); Winnipeg, "fields and prairies" (Macoun, 1872); Fort Garry (Schultz, 1861); plains west of Fort Garry (Macoun, 1872). First report: Morris [Yuncker, Ill. Biol.

Monogr. 6: 52. 1920]. Probable basis of the listing of *C. arvensis* Beyrich (C. *pentagona* Engelm.) by Jackson *et al.* [1922; "on *Lygodesmia*"] and Lowe [1943].

Temperate American: Sask. to sw. Que., s. to Calif., Tex., Mex., and S.C.; Trop. Am.

2. **C. coryli** Engelm. (*C. inflexa* Engelm.)

The following specimens have been seen: Winnipeg (W. E. Sackston, 1948, on tomato; determined by Anderson & Yuncker); Manitoba, "prairies" (Macoun, 1872). First report: the present publication.

Temperate American: Mont. to s. Man. and N.E., s. to Ariz., Tex., and N.C.

3. **C. cephalanthi** Engelm.

A specimen has been seen from Shellmouth, about 100 miles northwest of Brandon, where it was collected on *Ribes* by J. S. Bond in 1909. The specimen was determined by Yuncker. First report: Shellmouth [Groh, 1944].

Temperate American: s. B.C. to N.S., s. to N.M., Tex., and Va.

4. **C. gronovii** Willd.

Specimens have been seen from the following localities: Shoal Lake, near the Ontario boundary east of Winnipeg (Scott, 1920; Lowe, 1920); Winnipeg and vicinity (Churchward, 1911; Lowe, 1917); Victoria Beach, about 55 miles north-northeast of Winnipeg (Simpson, 1940); Morden, about 60 miles southwest of Winnipeg, thickets (Macoun, 1896); Portage la Prairie (McMorine, 1896); Pilot Mound, about 60 miles southwest of Portage la Prairie (Craig, 1940, on stem of *Pelargonium*). First report: Roseau River, south of Winnipeg [Dawson, 1875]. The citation from Norway House by Macoun [1884] is in need of verification.

Temperate American: Sask. to Que., s. to Ariz., Tex., and Fla.

5. **C. megalocarpa** Rydb. (*C. umbrosa* Hook.; *C. curta* (Engelm.) Rydb.)

Specimens have been seen from the following localities: Letellier, about 50 miles south of Winnipeg (Stevenson, 1951, on tomato plant); Winnipeg (Willing, 1907, on *Aster*; Batho, 1913, on *Parthenocissus*; Mackenzie, undated, on *Rubus*); Aweme, about 20 miles southeast of Brandon (Criddle, 1909, on *Aster*, oats, and *Convolvulus*); Brandon (Güssow, 1913, on *Symphoricarpos occidentalis*); Ste. Amelie, about 25 miles southeast of Dauphin (Oget, 1919, on ?*Solanum*); Dauphin, north of Riding Mountain (Groh, 1921, on *Salix interior*). First report: Winnipeg, Brandon, Ste. Amelie, and Dauphin [Groh, 1944].

Temperate western American: Mont. to Man., s. to Utah and Colo.

*C. epilinum* Weihe, Flax-Dodder: the following quotation is taken from Groh [1944]: "While no specimens are at hand it is understood that the dodder of flax in Manitoba is this species, and that it occurs little, if at all, on other hosts. Collections should be made."

## 95. POLEMONIACEAE

### (Polemonium Family)

1. Leaves alternate, linear-lanceolate to oblong-lanceolate; flowers very slender, in leafy-bracted terminal heads; seeds when moistened exuding spiraling threads. . . . 1. *Collomia*

1. Leaves opposite; flowers solitary or cymose; seeds not emitting spiraling threads. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *Phlox*

### 1. Collomia Nutt.

1. **C. linearis** Nutt. (*Gilia linearis* (Nutt.) Gray)

Thickets, shores, rock outcrops, and sandy clearings in the southern three-quarters of the province. Northernmost collection seen: Gillam, about 165 miles south of Churchill, sandy railway bank (Schofield, 1950); but reported from York Factory by Bell [1881]. Earliest collection seen: Brandon, thickets (Macoun, 1896). First report: Macoun [1884].

Temperate American: B.C. to e. Que., s. to Calif., N.M., Minn., and N.B.; adventive elsewhere.

### 2. Phlox L.

### (Phlox)

1. Leaves 3-10 cm. long, linear to narrowly lanceolate, attenuate to sharp tips; flowers pink or violet, several in a terminal cyme; stems erect or ascending, simple or sparingly branched. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1. *P. pilosa* var. *fulgida*

1. Leaves rigid and overlapping, awl-shaped, 4-10 mm. long; flowers white, solitary at the ends of the branches; stems densely tufted and branched; plant of dry prairie habitats. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *P. hoodii*

1. **P. pilosa** L. var. **fulgida** Wherry

The following is the only specimen seen: Winnipeg, sandy ground in park (Garton, 1944). First report: Winnipeg [Wherry, Bartonia 12: 43. 1930]. Basis of the citation of the main form from Red River by Dawson [1875] and of *P. aristata* from Winnipeg by Bourgeau [in Palliser, 1863].

Temperate eastern American: s. Man. to Wisc., s. to Kans. and Ind. A map of the distribution, together with that of the main form and other varieties, is given by Wherry [Bartonia 12: 39. 1930].

2. **P. hoodii** Richards. Moss Pink

Dry prairie slopes and sandhills of southwestern Manitoba. Northernmost collection: Bield, south of Duck Mountain, isolated prairie hills (Scoggan, 1951). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1874). First report: "Dry gravelly knolls and ridges from Manitoba to the Rocky Mountains in the northern part of the prairie region" [Macoun, 1874]. Basis of the listing of *P. canescens* by Burman [1910] and Jackson *et al.* [1922].

Subarctic western American: nw. Alaska and south-central Yukon; Alta. to s. Man., s. to Ida. and Neb.

## 96. HYDROPHYLLACEAE

### (Waterleaf Family)

1. Flowers solitary, their peduncles opposite or above the leaf-axils; calyx enlarged and "star"-shaped in fruit, its lobes about 10 mm. long; leaf-segments lanceolate or linear-oblong, sparingly cut-toothed.............................................1. *Ellisia*
1. Flowers in terminal scorpioid (uncoiling from the tip) cymes; calyx not enlarged in fruit.
   2. Stem smoothish; leaf-segments ovate-lanceolate or oblong, pointed, sharply cut-toothed; anthers long-exserted, their filaments pilose below; inflorescence long-peduncled; plant of shady woodland..............................2. *Hydrophyllum*
   2. Stem more or less hairy; leaf-segments lanceolate or linear-oblong, obtuse or short-pointed, sparingly toothed; anthers scarcely exserted (or long-exserted in the rare *P. tanacetifolia*), their filaments glabrous; inflorescence short-peduncled; plants of dry or waste habitats..............................................3. *Phacelia*

### 1. Ellisia L.

1. **E. nyctelea** L. (*Macrocalyx nyctelea* (L.) Kuntze)

Alluvial soil and disturbed land in the southern part of the province. Northernmost collection: Dauphin, north of Riding Mountain, alluvial soil (Groh, 1932). Earliest collection seen: East Crossing, Souris River, west of Turtle Mountain, low ground (Burgess, 1874). First report: "Eastern crossing of the Souris River, 49th parallel" [Macoun, 1884].

Temperate American: Alta. to Man., s. to N.M., Ark., and Ind.; e. Pa. and N.E. to N.C. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Constance [Rhodora 42: 37 (map 1). 1940].

### 2. Hydrophyllum L.

### (Waterleaf)

1. **H. virginianum** L. John's-cabbage

A single specimen has been seen, from Selkirk, about 15 miles northeast of Winnipeg, where it was collected in an open woods by Wallace in 1946. First report: Lowe [1943].

Temperate eastern American: e. Man. to Que., s. to Kans., Ark., Tenn., and Va. A map of the distribution of the collective species, on which the occurrence in Manitoba should be indicated, is given by Constance [Amer. Midland Nat. 27: 716. 1942].

### 3. Phacelia Juss.

### (Scorpion-weed)

1. Anthers much exserted, the stamens about twice the length of the corolla-tube................................................1. *P. tanacetifolia*
1. Anthers scarcely exserted.......................................2. *P. franklinii*

1. **P. tanacetifolia** Benth. Fiddle-neck

A single specimen has been seen, from Brandon, where it was collected as a garden weed on the grounds of the Experimental Farm by Macoun in 1896. First report: Brandon [J. M. Macoun, 1897].

Temperate western American: native range uncertain.

2. **P. franklinii** (R. Br.) Gray

Rock outcrops and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Gardner, 1930). Earliest collection seen: between York Factory and Norway House (McTavish, 1853-54). First report: "In burnt woods from the Grand Rapid of the Saskatchewan to the Rocky Mountains" [Macoun, 1884].

Subarctic American: central Alaska to Great Bear L., n. Man., and the n. shore of L. Superior, s. to Ida., Wyo., and Mich.

## 97. BORAGINACEAE

### (Borage Family)

1. Nutlets armed with barbed prickles.
  2. Nutlets depressed and spreading, covered by the prickles............7. *Cynoglossum*
  2. Nutlets erect or nearly so, prickly chiefly on their margins.
    3. Pedicels short, the fruiting calyces erect or ascending; receptacle subulate........ ..............................................................9. *Lappula*
    3. Pedicels slender, the fruiting calyces reflexed; receptacle broadly pyramidal...... ..............................................................8. *Hackelia*
1. Nutlets unarmed.
  4. Fruiting calyx greatly enlarged, strongly veined; flowers blue, axillary; stem rough with minute recurved prickles..................................10. *Asperugo*
  4. Fruiting calyx not obviously enlarged; flowers mostly in terminal cymes, these often coiled before anthesis; stems lacking recurved prickles.
    5. Flowers blue or roseate.
      6. Corolla rotate (wheel-shaped), with very short tube; anthers 6-9 mm. long, their short filaments prolonged into a spur-like appendage; plant harshly villous-hirsute..................................................2. *Borago*
      6. Corolla tubular or funnelform; anthers not more than 3·5 mm. long, their filaments unappendaged.
        7. Corolla irregular, oblique, 15-20 mm. long; stamens unequal, exserted on long filaments; style 2-cleft at apex................................3. *Echium*
        7. Corolla regular; stamens subequal, attached near summit of the corolla on short filaments; style simple.
          8. Racemes usually completely bractless; calyx pubescent at base with minute hooked or gland-tipped hairs..............................5. *Myosotis*
          8. Racemes more or less leafy-bracted; calyx glabrous or with appressed straight hairs..................................................11. *Mertensia*
    5. Flowers white, greenish-white, or yellow.
      9. Leaves chiefly opposite, linear or linear-spatulate; stem decumbent or spreading, usually much branched at base; corolla white, with a yellow eye in the throat.. .......................................................12. *Allocarya*
      9. Leaves alternate; stems erect or spreading-ascending.
        10. Plant glabrous; leaves fleshy, pale, spatulate to obovate; corolla white or bluish-tinged, with yellow eye; ovary unlobed..............1. *Heliotropium*
        10. Plants pubescent; ovary 4-parted above.
          11. Corolla tubular, greenish-white, its acuminate lobes erect; style long-exserted from the begining; anthers sagittate.............6. *Onosmodium*
          11. Corolla salver-form, its rounded or obtuse lobes spreading or spreading-ascending; style included or short-exserted; anthers oblong............. ..............................................4. *Lithospermum*

## 1. HELIOTROPIUM L.

1. **H. curassavicum** L. var. **obovatum** A. DC. (*H. spathulatum* Rydb.) Heliotrope

Specimens have been seen from the following localities in the southwestern corner of the province: Whitewater (Criddle, 1932; A. & D. Löve, 1953, very abundant in saline soil); Boissevain (Kyle, 1929); Medora, clay flats, alkaline (Scoggan, 1953); Lyleton (Allen, 1937); Deleau (Coupland, 1945). First report: Deleau [Jackson *et al.*, 1922]. Basis of reports of the main form from the province.

Temperate western American: Wash. to sw. Man., s. to Calif. and N.M.

## 2. BORAGO L.

1. B. OFFICINALIS L. Borage

Known in Manitoba from the following localities: Portage la Prairie, potato field (Batho, 1940); Ninette, about 30 miles south-southeast of Brandon, sandy roadside (Scoggan, 1951); Brandon, weed in cultivated soil (Stevenson, 1953). First report: the present publication. Basis of the citation of *Lycopsis arvensis* L. from Portage la Prairie by Groh [1944].

European: naturalized in temperate North America.

## 3. ECHIUM L.

(Viper's Bugloss)

1. E. PLANTAGINEUM L.

Known in Manitoba only from Brandon, where it was collected in dry soil along a roadside by G. Stevenson in 1953, being noted as occasional. First report: the present publication.

Eurasian: sparingly naturalized in the New World.

## 4. LITHOSPERMUM L.

(Gromwell. Puccoon)

1. Corolla white or bluish-white, 4-8 mm. long, scarcely longer than the calyx.
    2. Leaves linear or lanceolate, acute or obtuse, without lateral veins; flowers white or bluish-white, 5-8 mm. long; nutlets rough-wrinkled, dull................1. *L. arvense*
    2. Leaves lanceolate, gradually narrowed to an acute tip, with some lateral veins; flowers white, 4-5 mm. long; nutlets smooth or only slightly pitted, lustrous...............................2. *L. officinale*
1. Corolla yellow, much longer than the calyx.
    3. Flowers orange-yellow, the corolla-lobes entire; nutlets without basal collar; leaves mostly narrowly lanceolate to oblong...............................3. *L. canescens*
    3. Flowers bright yellow, the corolla-lobes shallowly toothed; nutlets constricted above a basal collar; leaves linear.......................................4. *L. incisum*

1. L. ARVENSE L. Corn-Gromwell

A single specimen has been seen, from Winnipeg, where it was collected in a field by K. W. Neatby in 1929. First report: Winnipeg [Bourgeau, in Palliser, 1863].

European: naturalized in temperate North America.

2. L. OFFICINALE L. European Gromwell

A single specimen has been seen, from High Bluff, near Portage la Prairie, where it was collected by I. L. Hargrave in 1883. First report: Morden [Groh, 1947]; but the specimen involved (H. Marshall, No. 41, Sept. 1, 1941) is referable to *Onosmodium hispidissimum.* The citation of the species from St. Lazare in the undated supplement to Lowe's 1943 checklist is based upon a collection of *L. canescens* from that locality (J. A. Campbell, July 24, 1943).

European: naturalized in temperate North America.

3. **L. canescens** (Michx.) Lehm. Puccoon. Indian-paint

Prairie, sandhills, rock outcrops, and clearings in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg (?McTavish, 1851; Scoggan, 1948, clearing on limestone substratum). Earliest collection seen: the foregoing 1851 collection from Grand Rapids. First report: Red River and Pembina Mountain [Dawson, 1875].

Temperate American: Sask. to w. Ont., s. to Tex. and Ga.

4. **L. incisum** Lehm. (*L. angustifolium* Michx.; *L. linearifolium* Goldie)

Dry prairie, sandhills, and clearings of southern Manitoba. Northernmost collection: St. Lazare, sandy "blowout" in prairie (Scoggan, 1951). Earliest collection seen: Little Saskatchewan River (the name at that time for the present-day Minnedosa River), dry gravelly soil (Macoun, 1872). First report: Winnipeg [Bourgeau, in Palliser, 1863].

Temperate American: B.C. to s. Ont., s. to n. Mex., Tex., and Ind.

### 5. MYOSOTIS L.

### (Forget-me-not)

1. M. ARVENSIS (L.) Hill

Specimens have been seen from the following localities: St. James, near Winnipeg (no data); Brandon, damp wooded soil, medium shade (G. Stevenson, 1953). First report: the present publication.

European: naturalized in North America.

### 6. ONOSMODIUM Michx.

### (False Gromwell. Marble-seed)

1. Nutlets with a very short neck or constriction at base; stem spreading-hirsute with rough bristly hairs............................................1. *O. hispidissimum*

1. Nutlets rounded and not at all constricted at base; stem spreading-pubescent........................................................................2. *O. occidentale*

1. **O. hispidissimum** Mack. (*O. carolinianum* of Am. auth., not A. DC.)

Dry prairie of southern Manitoba. Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg (Marshall, 1941); Darlingford, about 65 miles southwest of Winnipeg (Simpson, 1939); Brandon (Hart, 1949); Turtle Mountain (Burgess, 1873). First report: near Aweme [Criddle, 1927].

Temperate eastern American: s. Man. to s. Ont. and N.Y., s. to Tex., Tenn., and N.C.

2. **O. occidentale** Mack.

Dry prairie, sandhills, and thickets of southern Manitoba. Northernmost collection: Portage la Prairie (McMorine, 1891). Earliest collection seen: Turtle Mountain, thicket (Burgess, 1873). First report: "Manitoba" (E. S. Thompson, 1898) [Mackenzie, Bull. Torrey Bot. Cl. 32: 503. 1905]. Probable basis of the citation of *O. hispidum* Michx. (*O. virginianum* (L.) DC.) from Winnipeg by Bourgeau [in Palliser, 1863]. Basis of the citation of *O. "virginicum"* A. DC. from Turtle Mountain by Dawson [1875].

Temperate (interior) American: Sask. to s. Man., s. to N.M., Tex., and w. Ill.

### 7. CYNOGLOSSUM L.

1. Nutlets 5-7 mm. long, ascending, their flattened backs bordered by a rim; style firm and beak-like, overtopping the nutlets; corolla reddish-purple; stem leafy to summit............1. *C. officinale*

1. Nutlets 3·5-4·5 mm. long, horizontal, rimless; style delicate, hidden by nutlets; corolla pale blue to white; stem leafy only below the middle......................2. *C. boreale*

1. C. OFFICINALE L. Common Hound's-tongue

Specimens have been seen from the following localities: Otterburn, about 25 miles south of Winnipeg (Fast, 1944); Morden, about 60 miles southwest of Winnipeg (Groh, 1922; Walkof, 1931; Marshall, 1941); Brandon (Macoun, 1896, along an old road; Johansen, 1918, sandhills); Rossburn, about 70 miles northwest of Brandon, prairie slope (Scoggan, 1951). First report: Brandon [J. M. Macoun, 1897].

European: naturalized in North America.

2. **C. boreale** Fern. Northern Wild Comfrey

Specimens have been seen from the following localities: High Lake, on the Ontario boundary east of Winnipeg (Lowe, 1921); Whiteshell Forest Reserve, woods (Scoggan, 1951); Komarno, about 20 miles north of Winnipeg (Hunter, 1940); Grand Rapids, near the northwest end of Lake Winnipeg, clearing on limestone substratum (Scoggan, 1948). First report: Komarno and eastern boundary [Lowe, 1943].

(Subarctic-)temperate American: n. B.C. to e. Que., s. to s. B.C. and N.E.

## 8. HACKELIA Opiz

(Stickseed. Beggar's-lice)

1. Principal leaves broadly lanceolate, spreading, thin; flowers 1·5-2 mm. broad; nutlets 2-3 mm. long, with nearly subulate prickles........................1. *H. americana*
1. Principal leaves narrowly lanceolate, strongly ascending, firm; flowers 5-8(-10)mm. broad; nutlets 3-4 mm. long, with flat-subulate prickles........................*H. floribunda*

1. **H. americana** (Gray) Fern. (*Lappula americana* (Gray) Rydb.; *L. deflexa* var. *americana* (Gray) Greene)

Thickets and clearings in the southern two-fifths of the province. Northernmost collection seen: The Pas (Krivda, 1949); but reported from Churchill by Radforth [1950]. Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: near Aweme [Criddle, 1927]. Basis of reports of *Lappula deflexa* (*Echinospermum deflexum*) from the province.

Temperate American: B.C. to e. Que., s. to Wash., Kans., Wisc., and Vt.

*H. floribunda* (Lehm.) Johnston (*Echinospermum floribundum* Lehm.; *Lappula floribunda* (Lehm.) Greene) is cited from Red River and Turtle Mountain by Dawson [1875], listed by Jackson *et al.* [1922], and cited from Victoria Beach by Lowe [1943]. Manitoba is included in the range given by Gleason [1952], but the eastern limit is western Ontario according to Fernald [1950]. No specimens have been seen, and it should be excluded from our flora for the present.

## 9. LAPPULA Moench

(Stickseed)

1. Margins of nutlets with a double row of slender distinct prickles; stem erect.............................................................................1. *L. echinata*
1. Margins of nutlets with a single row of stout flattened prickles, these sometimes confluent at base; plant at length diffuse......................2. *L. redowskii* var. *occidentalis*

1. L. ECHINATA Gilib. (*Echinospermum lappula* Lehm.; *L. lappula* (L.) Karst.; *L. myosotis* Moench)

Roadsides and waste places throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the first by Polunin in 1934). Earliest collection seen: Brandon, in an old garden (Macoun, 1896). First report: Red River [Dawson, 1875].

European: widely naturalized in North America.

2. **L. redowskii** (Hornem.) Greene var. **occidentalis** (Wats.) Rydb. (*L.* occidentalis (Wats.) Greene)

Dry, sandy prairie and waste places in the southern part of the province. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandy "blowout" in prairie (Scoggan, 1951). Earliest collection seen: Pembina Mountain, open prairie (Burgess, 1873). First report: Jackson *et al.* [1922]. Basis of the citation of *Echinospermum patulum* Lehm. from Red River by Dawson [1875] and the listing of the main form by Burman [1910]. Basis of the listing of *L. heterosperma* Greene by Lowe [1943].

Subarctic western American: north-central Alaska and nw. Mack. to s. Man., s. to Calif., Tex., and Mo.; adventive eastward to N.E.

## 10. ASPERUGO L.

(Madwort)

1. A. PROCUMBENS L.

Known in Manitoba only from near Manitou, about 50 miles south of Portage la Prairie, where it was collected on a farm by G. R. Fraser in 1947. The specimen was determined by H. Groh and is in the herbarium of the Department of Botany and Plant Pathology, Department of Agriculture, Ottawa. The sheet bears the annotation "There are probably 3 acres infested with this plant and so far as the people who own the farm know, it has been there for at least 3 years". First report: the present publication.

European: sparingly naturalized in eastern North America.

## 11. MERTENSIA Roth

(Lungwort)

1. Leaves hirsute on both sides; stem erect............................1. *M. paniculata*
1. Leaves glabrous or merely papillose.
  2. Leaves fleshy, whitened, borne on trailing branches; plant of the Hudson Bay coast..............2. *M. maritima*
  2. Leaves green, not fleshy; plant erect..............................*M. lanceolata*

**1 M. paniculata** (Ait.) G. Don

Thickets, woods, rock outcrops, and shores in the southern four-fifths of the province. Northernmost collection seen: York Factory (McTavish, undated, but almost certainly collected in 1853 or 1854; the earliest dated specimen seen was collected by Macoun in 1884, on Observation Point, opposite Hecla Island, Lake Winnipeg). The species is reported as far north as Churchill River between Southern Indian Lake and the mouth of Little Churchill River [Alcock, 1916]. There is a specimen purportedly from Churchill in the National Herbarium of Canada (Gardner, No. 83, July 7, 1930), but a sheet in the herbarium of the Agricultural Institute at Oka, P.Q., bearing the same collection number, is attributed to Moose Factory, near the south end of James Bay. Gardner [1937] does not cite the species from Churchill. Earliest collection seen: the foregoing York Factory specimen. First report: various localities cited by Macoun [1884]. Basis of reports of *M. lanceolata* (Pursh) DC. from the province, and the listing of *M. pilosa* (Cham.) D. Don by Lowe [1943]. According to Williams [Ann. Mo. Bot. Gard. 24: 140. 1937], the type of the latter was not seen by him, nor was he able to determine the identity of the species.

Subarctic American: north-central Alaska and n. Yukon to n. Man., James Bay, and Que., s. to Wash., n. Ia., and n. Mich. A map of the greater part of the distribution is given by Raup [1947, pl. XXXIV].

**2. M. maritima** (L.) S. F. Gray (Incl. var. *tenella* Fries; *Pneumaria maritima* (L.) Hill) Oysterleaf

Specimens have been seen only from the seashore at Churchill, the earliest collection seen from that locality having been made by Macoun in 1910. It is also reported from Churchill River (presumably near the mouth) by Bell [1880], from near York Factory by Richardson ["H", in Franklin, 1823], and from between York Factory and Churchill by Rae [1850]. First report: the foregoing York Factory citation.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Baffin I.), n. Que., n. Lab., and Nfld., s. along the coasts to B.C., James Bay, and Mass.; Greenland; Iceland; Spitsbergen; n. Eurasia.

### 12. ALLOCARYA Greene

**1. A. californica** (F. & M.) Greene

Known in Manitoba only from near Melita, about 60 miles southwest of Brandon, where it was collected by the writer in 1953 in wet alkaline soil of the old Souris River channel south of the town, growing with *Plantago elongata* Pursh. First report: the present publication.

Temperate western American: Sask. and sw. Man., s. to Calif., Colo., and Neb.

### ***Amsinckia*** Lehm.

*A. tesselata* Gray: a specimen appearing referable here was collected at Neepawa, about 35 miles northeast of Brandon, by Stonehouse in 1911. It was evidently a casual introduction.

### ***Cryptantha*** Lehm.

*C. crassisepala* (T. & G.) Greene is cited from Stony Mountain, near Winnipeg, by Jackson *et al.* [1922] and Lowe [1943]. No specimens have been seen, however, and Manitoba is far north of the range given by Johnston [Contrib. Gray Herb. 74: 59. 1925]. It is possible that *C. minima* Rydb., which, according to Johnston, "is the name to be taken up for the bracteate material from the Great Plains until now passing as *C. crassisepala*", will be found to occur in the province.

*C. bradburiana* Payson (*Eritrichium glomeratum* (Pursh) DC.; *Oreocarya glomerata* (Pursh) Greene) is reported by Macoun [1884] as occurring on "Dry gravelly hills and tops of ridges from Brandon westward across the prairie region." A specimen in the herbarium of McGill University (Macoun, No. 928, Aug. 10, 1872) bears the somewhat ambiguous indication of locality "West of Manitoba" (presumably the "western part" of the province), but, in view of the absence of later collections, it seems best to exclude this species from our flora for the present.

*C. macounii* (Eastw.) Payson (*Oreocarya macounii* Eastw.), doubtfully distinct from the foregoing species, is accredited to Manitoba in the range given by Rydberg [1932], and is listed by Lowe [1943] on this basis. No specimens have been seen, however, and it should be excluded from our flora for the present.

### ***Lycopsis*** L.

*L. arvensis* L., Small Bugloss, is cited from Portage la Prairie by Groh [1944], but the specimen concerned (G. Batho. 1940, potato field) is referable to *Borago officinalis.*

### ***Symphytum*** L.

*S. officinale* L., Common Comfrey, is cited from Bissett, near the Ontario boundary about 120 miles northeast of Winnipeg, by Groh & Frankton [1949], but the specimen concerned (B. J. Marck, Aug. 23, 1935) is referable to *Mertensia paniculata.* It is also cited from Riding Mountain by Lowe [1943], but no supporting specimen was seen. The species should be excluded from our flora for the present.

## 98. VERBENACEAE

(Vervain Family)

### 1. Verbena L.

(Vervain)

1. Spikes solitary at the tips of the stem and branches, with divergent bracts much longer than the calyces; corolla purple; leaves pinnately incised or lobed........1. *V. bracteata*
1. Spikes in a terminal panicle or raceme, their bracts mostly shorter than the calyces; corolla violet-blue; leaves coarsely and doubly serrate....................2. *V. hastata*

1. **V. bracteata** Lag. & Rodr. (*V. bracteosa* Michx.)

Open ground in the southwestern prairie region. Specimens have been seen from the following localities: Crystal City, about 60 miles southwest of Portage la Prairie, roadside (Thomas, 1935); Cartwright, east of Turtle Mountain (Burman, undated); Wawanesa, about 20 miles southeast of Brandon, prairie and waste ground (Groh, 1932); Ninga, near the north edge of Turtle Mountain (Sage, 1923); Melita, about 60 miles southwest of Brandon, alkaline ground of old Souris River channel south of town (Scoggan, 1951); Lyleton, about 80 miles southwest of Brandon, sandy grassland (Scoggan, 1951). Reported also from Lena and Elgin by Lowe [1943] and from near Aweme by Criddle [1927]. First report: Burman [1910].

Temperate American: s. B.C. to s. Ont. and Va., s. to Calif., n. Mex., and Fla.; adventive farther to the northeast to N.E.

2. **V. hastata** L. Blue Vervain

Specimens have been seen from the following localities: Marchand, about 40 miles southeast of Winnipeg, wet ground (Breitung, 1949); Caddy Lake, near the Ontario boundary east of Winnipeg (Leach, 1940); Selkirk, about 20 miles northeast of Winnipeg, shore of creek (Peterson, 1929); Grand Beach, near the south end of Lake Winnipeg (Lowe, 1919); Gimli, about 45 miles north of Winnipeg (A. & D. Löve, 1952); Washow Bay, south of The Narrows, Lake Winnipeg, low ground (Macoun, 1884); Morden, about 60 miles southwest of Winnipeg, ravine (Marshall, 1939); Austin, about 25 miles west of Portage la Prairie (Simpson, 1934). First report: Winnipeg [Bourgeau, in Palliser, 1863; as *V. paniculata*].

Temperate American: B.C. to N.S., s. to Calif., Tex., and nw. Fla.

## 99. LABIATAE

(Mint Family)

1. Corolla apparently 1-lipped (the 2 small lobes of the upper lip united with the lateral lobes of the declined lower lip, the middle lobe of the latter much the larger); ovary merely 4-lobed; style not basal; nutlets laterally attached, almost completely united ..............................................................1. *Teucrium*
1. Corolla 2-lipped or nearly regular; ovary deeply 4-parted; style basal; nutlets basally attached, nearly distinct.

2. Calyx with a helmet-like protuberance on the upper side; stamens 4, ascending under the upper lip of the blue-violet corolla..............................2. *Scutellaria*

2. Calyx without a helmet-like protuberance; stamens mostly extended straight forward and exserted beyond the corolla-tube.

3. Corolla nearly regular, the lobes nearly or quite equal.

4. Flowers in axillary clusters.

5. Anther-bearing stamens 2; flowers white; plant inodorous........15. *Lycopus*

5. Anther-bearing stamens 4; flowers lilac-pink or purplish; plant strongly aromatic..................................................16. *Mentha*

4. Flowers pale purple, subtended by broad green mucronate veiny bracts in dense spikes terminating the main axis and branches; anther-bearing stamens 4..........................................................17. *Elsholtzia*

3. Corolla strongly 2-lipped, the lips unequal, the upper one helmet-shaped or concave.

6. Flowers clustered in the axils of normal foliage leaves; anther-bearing stamens 4.

7. Stems weak and extensively creeping; leaves crenate, roundish to kidney-shaped; flowers purplish-blue................................5. *Glechoma*

7. Stems erect or decumbent at base, not creeping.

8. Stems hard; leaves deeply 3-5-lobed or incised, the upper as well as the lower ones commonly long-petioled; teeth of the calyx-tube more or less spreading ......................................................9. *Leonurus*

8. Stems soft; leaves merely coarsely toothed, the floral ones sessile or short-petioled; teeth of calyx-tube erect.

9. Calyx-teeth spiny; anthers opening by transverse valves; floral-leaves short-petioled; stem bristly-hirsute, swollen below the joints..........................................................10. *Galeopsis*

9. Calyx-teeth not spiny; anthers opening by longitudinal valves; floral-leaves sessile and more or less clasping; stem glabrous, not swollen below joints..............................................11. *Lamium*

6. Flowers chiefly in terminal capitate clusters, spikes, or spike-like racemes, these, if interrupted, with whorls subtended by bracts or much reduced floral-leaves.

10. Anther-bearing stamens 2.

11. Anther-connectives very short, the sacs confluent; calyx regular, its 5 teeth subequal; flowers lilac or pink, 2-3 cm. long, in a solitary dense cluster.............................................14. *Monarda*

11. Anther-connectives very long, bearing a perfect sac at the ascending end and none at the decending end (on the other side of the point of articulation with the filament); calyx 2-lipped, with unequal lobes; flowers blue, 8-13 mm. long, in elongate and interrupted spikes or spicate racemes...............................................................13. *Salvia*

10. Anther-bearing stamens 4.

12. Upper (inner) pair of stamens longer than the lower; calyx 13-15-nerved.

13. Corolla light blue to violet, only slightly exceeding the calyx; upper lobe of calyx broader and longer than the lateral and lower pairs; leaves and bracts spiny-toothed, scarcely whitened beneath.........................................................6. *Moldavica*

13. Corolla conspicuously exceeding the calyx; calyx-lobes all subequal; leaves not spiny-toothed, conspicuously whitened beneath.

14. Stamens conspicuously exserted beyond the blue corolla, the anther-sacs nearly parallel; leaves truncate or sometimes subcordate at base; stem glabrous...............................3. *Agastache*

14. Stamens ascending under the upper lip of the white, purple-dotted corolla and scarcely exserted beyond it, the anther-sacs strongly divergent; leaves cordate at base; stem finely pubescent...................................................4. *Nepeta*

12. Upper pair of stamens shorter than the lower; calyx 5-10-nerved.

15. Calyx strongly 2-lipped, the upper lip nearly truncate or with 3 short teeth, the lower lip deeply 2-cleft; flowers blue or purple, in a very dense spike; leaves mostly long-petioled................7. *Prunella*

15. Calyx not strongly 2-lipped, the lobes subequal; spikes open; leaves sessile or short-petioled.
    16. Calyx thin, inflated in fruit, its short teeth triangular; anther-sacs nearly parallel; plant essentially glabrous. . .8. *Dracocephalum*
    16. Calyx firm, not inflated in fruit, its lance-attenuate teeth more than half as long as the tube; anther-sacs divergent; plants more or less hirsute. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12. *Stachys*

### 1. TEUCRIUM L.

(Germander)

1. Calyx viscid-villous, the three upper lobes acute. . . . . . . . . . . . . . . . . . . . 1. *T. occidentale*
1. Calyx with a felt-like pubescence, at least the two lateral upper lobes obtuse. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *T. canadense*

**1. T. occidentale** Gray

Specimens have been seen from the following localities: Birds Hill, near Winnipeg, low wet ground (Macoun, 1896); Fort Whyte, near Winnipeg, moist clay soil (Garton, 1946); Delta, near the south end of Lake Manitoba, salt marsh pasture (A. Löve, 1951); Deerhorn, about 65 miles northwest of Winnipeg, low ground (Scoggan, 1951); Eriksdale, about 70 miles northwest of Winnipeg, grassy clearing (Scoggan, 1951); Langruth, about 30 miles northwest of Portage la Prairie (A. & D. Löve, 1952); Brandon (Macoun, 1896, thickets; Stevenson, 1954, damp shaded soil); Whitewater Lake, north of Turtle Mountain (A. & D. Löve, 1953). First report: near Aweme [Criddle, 1927]. Basis of reports of *T. canadense* L. from the province. Some or all of the Manitoba material may be referable to the scarcely distinct var. *boreale* (Bicknell) Fern.

Temperate American: B.C. to s. Que., s. to Calif., N.M., and Pa.

### 2. SCUTELLARIA L.

(Skullcap)

1. Flowers 1·5-2·5 cm. long, solitary in the leaf-axils; leaves crenate, sessile or short-petioled; pubescence of stem recurving. . . . . . . . . . . . . . 1. *S. galericulata* var. *epilobiifolia*
1. Flowers 5-9 mm. long, in 1-sided terminal and axillary racemes; leaves coarsely serrate, slender-petioled; pubescence of stem ascending. . . . . . . . . . . . . . . . . . . . . . . . 2. *S. lateriflora*

**1. S. galericulata** L. var. **epilobiifolia** (Hamilt.) Jordal (Incl. var. *pubescens* Benth.; *S. epilobiifolia* Hamilt.) Common Skullcap

Wet open ground throughout the province except the extreme north. Northernmost collection seen: Warkworth Creek, 10 miles south of Churchill wet bank (Gillett, 1948). Reported from Churchill by Radforth [1950]. Earliest collection seen: Muskeg Island, Lake Winnipeg, wet places (Macoun, 1884). First report: various localities [Lowe, 1943]. Basis of reports of the main form from the province. For discussion, *see* Fernald [Rhodora 23: 85. 1921], Epling [Univ. Calif. Pub. Bot. 20: 16-18. 1942], Hultén [1949, p. 1363], and Jordal [Rhodora 53: 156-157. 1951].

Subarctic American: central Alaska to n. Man., se. Lab., and Nfld., s. to Calif., N.M., Kans., and s. Pa. A map of the distribution (as *S. galericulata* L.) is given by Epling [Univ. Calif. Pub. Bot. 20: 5 (map 2). 1942].

2. **S. lateriflora** L. Mad-dog Skullcap

Specimens have been seen from the following localities: Winnipeg, moist woods (Neatby, 1928); "White Lake", shore (Lowe, 1944); Victoria Beach, about 55 miles north-northeast of Winnipeg (Bisby, 1931; Lowe, 1940); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, rocky shore (Breitung, 1949); Brandon, ravine (Macoun, 1896). Reported also from near Aweme by Criddle [1927], and from Morden, Rossburn, and Riding Mountain by Lowe [1943]. First report: Cross Lake northeast of Lake Winnipeg, and various parts of the Echimamish-Hayes system [Bell, 1881].

(Subarctic-)temperate American: s. B.C. to Nfld., s. to s. Calif. and Ga. A map of the distribution is given by Epling [Univ. Calif. Pub. Bot. 20: 5 (map 2). 1942].

### 3. AGASTACHE Clayt.

1. **A. foeniculum** (Pursh) Ktze. (*A. anethiodora* Britt.; *Lophanthus anisatus* Benth.) Blue Giant Hyssop

Thickets, prairie, and sandhills in the southern third of the province. Northernmost collection: Porcupine Mountain, dry clearing (Scoggan & Baldwin, 1950). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Winnipeg and Turtle Mountain [Dawson, 1875].

(Subarctic-)temperate western American: B.C. and sw. Mack. to s. Man. and w. Ont., s. to Wash., Colo., S.D., and Ill.; adventive farther eastward. A map of the greater part of the distribution is given by Lint & Epling [Amer. Midland Nat. 33: 213 (map 1). 1945].

### 4. NEPETA L.

1. N. CATARIA L. Catnip

Specimens have been seen only from Coulter, about 70 miles southwest of Brandon, where it was collected in thickets by the writer in 1951 and 1953. First report: Morden and East Kildonan [Jackson *et al.*, 1922].

European: widely naturalized in North America.

### 5. GLECHOMA L.

1. G. HEDERACEA L. (*Nepeta hederacea* (L.) Trevisan; *N. glechoma* Benth.) Gill-over-the-ground

Woods and thickets in the southern two-thirds of the province. Northernmost collection: The Pas (Krivda, 1948). Earliest collection seen: Rosewood, southeast of Winnipeg (Lowe, 1917). First report: Burman [1910].

European: widely naturalized in North America.

### 6. MOLDAVICA Adans.

### (Dragonhead)

1. Whorls of flowers crowded into terminal heads, these with spiny-tipped and sharp-toothed overlapping bracts; calyx about 10 mm. long..................1. *M. parviflora*
1. Whorls of flowers in prolonged interrupted spikes; bracts narrow, subentire; calyx 6-7 mm. long........................................................2. *M. thymiflora*

1. **M. parviflora** (Nutt.) Britt. (*Dracocephalum parviflorum* Nutt.)

Thickets, prairie, rock outcrops, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Polunin, 1936). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Churchill River [Bell, 1880].

Subarctic American: north-central Alaska to n. Man. and e. Que., s. to Ariz., N.M., Neb., and N.Y.

2. M. THYMIFLORA (L.) Rydb. (*Dracocephalum thymiflorum* L.)

Specimens have been seen from the following localities: Portage la Prairie, railway yard (Lindsay, 1953); Brandon, waste and cultivated land (Stevenson, 1952). First report: near Forrest, north of Brandon [Groh & Frankton, 1949].

Eurasian: sparingly naturalized in North America.

### 7. PRUNELLA L.

1. **P. vulgaris** L. var. **lanceolata** (Barton) Fern. Heal-all. Carpenter-weed

Grassland and waste ground in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, clearing on limestone substratum (Scoggan, 1948). Earliest collection seen: Brandon, ravine (Macoun, 1896). First report: the present publication. Basis of reports of the main form from the province.

Subarctic American: central Alaska to north-central Sask., s. Lab., and Nfld., s. to Calif., N.M., Kans., and N.C.; the whole species circumpolar.

Var. *lanceolata* forma *iodocalyx* Fern., with purple calyx, is of frequent occurrence in the province.

### 8. DRACOCEPHALUM L.

### (False Dragonhead)

1. Uppermost leaves usually shorter than the subtended nodes, entire or nearly so; calyx 5·5-10 mm. long; corolla 2·5-3 cm. long..........................1. *D. virginianum*
1. Uppermost leaves mostly longer than the subtended nodes, usually distinctly toothed; calyx 4-7 mm. long.
   2. Uppermost leaves widest near the middle and tapering at both ends; corolla 1·5-3 cm. long........................................................2. *D. formosius*
   2. Uppermost leaves widest near the broadly rounded base; corolla 12-16 mm. long..........................................................................3. *D. nuttallii*

1. **D. virginianum** L. (Incl. *D. speciosum* Sweet)

This species appears to be represented in the National Herbarium of Canada by the following collection: Point du Chien (presumably Doghead Point at the north end of The Narrows, Lake Winnipeg), "margins of lakes and streams" (Macoun, 1872). First report: various localities [Macoun, 1884]. The Turtle Mountain and Lake Winnipeg citations, however, are referable to the following species, from which *D. virginianum* is doubtfully distinct.

Temperate eastern American: s. Man. to s. Que., s. to N.D., La., Tenn., and N.C.

2. **D. formosius** (Lunell) Rydb. (*D. virginianum* of Am. auth., not L.; *Physostegia formosior* Lunell)

Damp thickets and wet ground in the southern half of the province. Northernmost collection: Cranberry Portage, southeast of Flin Flon (Freedman, 1950). Earliest collection seen: Fort Garry (Schultz, 1861). First report: the present publication. Basis of most reports of *D. virginianum* from the province.

Temperate American: Alta. to Man. and Me., s. to Neb., Mo., O., and N.Y.

3. **D. nuttallii** Britt. (*Physostegia parviflora* Nutt.)

Represented in the National Herbarium of Canada by a collection made by the writer in 1953 in shallow water near Virden, about 45 miles west of Brandon. First report: Jackson *et al.* [1922].

(Subarctic-)temperate American: n. B.C. to s. Man. and Wisc., s. to Oreg., Colo., and Ind.

### 9. LEONURUS L.

### (Motherwort)

1. Upper lip of the pale pink corolla densely white-villous; calyx strongly 5-angled, its two lower lobes strongly deflexed; lower leaves palmately lobed, the upper ones subentire or 3-lobed........................................................1. *L. cardiaca*
1. Upper lip of the purplish corolla finely pubescent; calyx scarcely angled, the lower lobes scarcely deflexed; leaves all deeply 3-parted, the divisions themselves incised or cleft...
........................................................2. *L. sibiricus*

1. L. CARDIACA L. Common Motherwort

Specimens have been seen from the following localities: Birds Hill, near Winnipeg, gravel pit (Scoggan, 1951); Victoria Beach, about 55 miles north-northeast of Winnipeg, roadside (Lowe, 1949); Morden, about 60 miles southwest of Winnipeg, waste land (Scoggan, 1953); Miami, about 60 miles southwest of Winnipeg (Reeve, undated); Delta, near the south end of Lake Manitoba (A. & D. Löve, 1953); Dauphin, north of Riding Mountain (Groh, 1932; referable to var. *villosus* (Desf.) Benth. according to C. Frankton). First report: the present publication.

European: widely naturalized in North America.

2. L. SIBIRICUS L.

Known in Manitoba only from Dufrost, about 30 miles south of Winnipeg, where it was collected by N. Pankiw in 1940. First report: Dufrost [Groh, 1947].

Eurasian: naturalized in North America.

### 10. GALEOPSIS L.

### (Hemp-Nettle)

1. G. TETRAHIT L. var. BIFIDA (Boenn.) Lej. & Court.

Thickets, gardens, and waste ground in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railway embankment (Schofield, 1950). Earliest collection seen: Delta, near the south end of Lake Manitoba (Jackson, 1921). First report: the present publication. Basis of reports of the main form from the province.

European: widely naturalized in North America.

Var. *bifida* forma *albiflora* House, with white corolla, has been collected at Brandon with the typical form (Stevenson, 1953).

### 11. LAMIUM L.

1. L. AMPLEXICAULE L. Henbit

Specimens have been seen from the following localities: St. Vital, near Winnipeg, garden (Houston, 1944); Brandon, garden (Marshall, 1946); Minitonas, north of Duck Mountain (unknown collector, 1931). First report: Grandview, north of Riding Mountain [Jackson *et al.*, 1922].

European: naturalized in North America.

### 12. STACHYS L.

### (Hedge-Nettle)

1. Stem pubescent on the sides as well as on the angles; leaves softly pubescent on both sides ........ 1. *S. palustris* var. *pilosa*
1. Stem pubescent on the angles only with deflexed bristly hairs; leaves glabrous or somewhat pubescent above ........ 2. *S. tenuifolia* var. *hispida*

1. **S. palustris** L. var. **pilosa** (Nutt.) Fern. (*S. scopulorum* Greene) Woundwort

Thickets, meadows, shores, and clearings throughout the southern three-quarters of the province. Northernmost collection: Churchill River near Southern Indian Lake (Cairnes, 1915). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Turtle Mountain [Ellis & Shafer, 1940; as *S. scopulorum*]. Basis of earlier reports of the main form from the province, and of *Stachys aspera* from Mile 189 of the Hudson Bay Railway (measured from The Pas) by Gardner [1937]. Some of the Manitoba material may be referable to the intergrading var. *nipigonensis* Jennings, with narrower and more pointed leaves.

Subarctic American: central Alaska to n. Man., James Bay, and Que., s. to Ariz., Neb., and Ont.; adventive to N.E.

2. **S. tenifolia** Willd. var. **hispida** (Pursh) Fern. (*S. hispida* Pursh)

Specimens appearing referable here have been seen from the following localities: Winnipeg and vicinity (several collections, the earliest seen being made by Buller in 1918); Winkler, about 60 miles southwest of Winnipeg, thicket (Scoggan, 1953); Inwood, about 40 miles north-northeast of Winnipeg (Dudley, 1929); Delta, near the south end of Lake Manitoba (A. & D. Löve, 1951). First report: the present publication; but accredited to Manitoba in the range given by Gleason [1952]. Probable basis of the report of *S. aspera* Michx. from Winnipeg and Dufferin by Dawson [1875]. Some of the Manitoba material appears referable to the intergrading var. *platyphylla* Fern., with generally broader leaves than var. *hispida*. Further study is required of the genus in the province.

Temperate eastern American (incl. var. *platyphylla* Fern.): s. Man. to s. Que., s. to Ill., Va., and S.C. Maps of the distribution of var. *hispida* and var. *platyphylla*, on which the occurrence of one or both in Manitoba should be indicated, are given by Fernald [Rhodora 45: 467 (maps 3 and 4). 1943].

### 13. SALVIA L.

### (Sage)

1. Flowers on pedicels 2-3 mm. long; upper lip of calyx entire; corolla only slightly exserted; bracts lance-subulate, about equalling the pedicels; leaves lance-linear to lanceolate, petioled; stem slender, often bushy-branched.......................... 1. *S. reflexa*
1. Flowers subsessile; upper lip of calyx with 3 short teeth; corolla twice the length of the calyx; bracts orbicular, with an awn-like tip, purplish, about as long as the calyces; leaves oblong-lanceolate, rugose, the upper ones sessile; stem stout, simple or branching above.................................................... 2. *S. sylvestris*

1. **S. reflexa** Hornem.

A single specimen has been seen, from Winnipeg, where it was collected along a railway by W. Munn in 1946. The specimen, determined by H. Groh, is in the herbarium of the Division of Botany and Plant Pathology Department of Agriculture, Ottawa. First report: the present publication.

Temperate western American: Mont. to s. Man. and Wisc., s. to Mex., Tex., and Ark.; adventive to N.J. and W. Va.

2. S. SYLVESTRIS L.

Represented in the National Herbarium of Canada by a collection from Ninette, about 30 miles south-southeast of Brandon, where it was collected along a railway by S. Criddle in 1923. First report: Ninette [Groh & Frankton, 1949].

European: sparingly naturalized in North America.

### 14. MONARDA L.

1. **M. fistulosa** L. (Incl. the intergrading var. *mollis* (L.) Benth. and var. *menthaefolia* (Graham) Fern.) Wild Bergamot

Thickets, prairie, and clearings in the southern two-fifths of the province. Northernmost collection seen: Grand Rapids, near the northwest end of Lake Winnipeg, gravel ridge (Scoggan, 1948). Reported also from The Pas by W. Krivda in a letter to the writer. Earliest collection seen: Fort Garry (Schultz, 1861). First report: Turtle Mountain, open prairie [Dawson, 1875]. Further study is required of this species and its varieties in the province.

(Subarctic-)temperate American: n. Alta. to central Man. and sw. Que., s. to Ariz., Mex., La., and Ga. Maps of the distribution of the main form (incl. var. *mollis*) and var. *menthaefolia* are given by McClintock & Epling [Univ. Calif. Pub. Bot. 20: 166 (fig. 8) and 170 (fig. 9). 1942].

### 15. LYCOPUS L.

(Water-Horehound. Bugleweed)

1. Calyx-teeth ovate or triangular, shorter than the nutlets; leaves coarsely toothed........................................................................1. *L. uniflorus*
1. Calyx-teeth acuminate or spiny-tipped, overtopping the nutlets.
    2. Leaves petioled, the lower primary ones incised or pinnatifid, especially at base; stolons not developing tubers..........................................2. *L. americanus*
    2. Leaves sessile, scabrous, firm, often appressed-ascending, sharply toothed; stolons developing elongate tubers..........................................3. *L. asper*

1. **L. uniflorus** Michx.

Specimens have been seen from the following localities: Sundown, about 60 miles southeast of Winnipeg, swampy ground (Scoggan, 1953); Caddy Lake, near the Ontario boundary east of Winnipeg (Leach, 1939); Libau, about 25 miles northeast of Winnipeg, swamp (A. & D. Löve, 1952); Sasaginnigak Lake, about 125 miles northeast of Winnipeg, wet rocky shore (Breitung, 1949); Norway House, near the northeast end of Lake Winnipeg, wet woods (Scoggan, 1948); Hill Lake, north of Lake Winnipeg, limestone shingle at entrance of Minago River (Scoggan, 1948); Killarney, near Turtle Mountain, shore of Pembina River (Macoun, 1896); Riding Mountain, lake margin (Rowe, 1948); Duck Mountain, wet meadow (Rowe, 1950); Swan River, north of Duck Mountain (Groh, 1922); Reindeer Lake, lat. 57° 23′ N., gravel by creek (Baldwin, 1951). First report: Jackson *et al.* [1922].

Subarctic American: central Alaska to n. Man. and Nfld., s. to Oreg., Mont., Okla., Ia., and N.C.; e. Asia.

2. **L. americanus** Muhl. (*L. sinuatus* Ell.)

Swampy ground and shores in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, damp ditch (Schofield, 1950). Earliest collection seen: Souris Plain, Man., borders of marshes (Macoun, 1883). First report: Burman [1910].

(Subarctic-)temperate American: B.C. to Nfld., s. to Calif., Tex., and Fla.

3. **L. asper** Greene (*L. lucidus* Turcz. var. *americanus* Gray)

Damp to wet ground in the southern third of the province. Northernmost collection: Birch River, off the east edge of Porcupine Mountain, damp ground (Scoggan, 1950). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Jackson *et al.* [1922]. Basis of the listing of *L. lucidus* by Burman [1910].

Temperate western American: B.C. to Man., s. to Calif., Mo., and Mich.; adventive farther eastward.

### 16. MENTHA L.

### (Mint)

1. Flowers in whorls in the leaf-axils of the upper half or third of the stem; calyx 2-3 mm. long........................................1. *M. arvensis* var. *villosa*
1. Flowers in terminal spikes bearing conspicuous narrow bracts toward the base; calyx 1·5-2 mm. long........................................*M. spicata*

1. **M. arvensis** L. var. **villosa** (Benth.) Stewart (*M. canadensis* L.)

Swampy ground, shores, and rock outcrops in the southern two-thirds of the province. Northernmost collection seen: Gillam, about 165 miles south of Churchill (Schofield, 1950). Reported also from Churchill River between Southern Indian Lake and the mouth of Little Churchill River by Alcock [1916]. Earliest collection seen: Fort Garry (Schultz, 1860). First report: Fort Garry [Schultz, 1861].

Subarctic American: central Alaska to n. Man., s. Lab., and Nfld., s. to Calif., N.M., Neb., and Pa.

Var. *villosa* forma *glabrata* (Benth.) Stewart (*M. glabrior* (Hook.) Rydb.) is the common form in the province.

*M. spicata* L., Spearmint, is represented by a collection from Winnipeg made by E. Malkiewich in 1949, but with no indication as to whether it had been cultivated or found as an escape.

### 17. ELSHOLTZIA Willd.

1. E. CILIATA (Thunb.) Hylander (*E. cristata* Willd.; *E. patrini* (Lepechin) Garcke)

Known in Manitoba only from Birds Hill, near Winnipeg, where it was collected in moist ground by W. N. Denike in 1944. First report: Birds Hill [Groh & Frankton, 1949; as *E. cristata*].

Asiatic: sparingly naturalized in eastern North America.

### *Satureja* L.

*S. vulgaris* (L.) Fritsch var. *neogaea* Fern., Dogmint, is accredited to Manitoba in the range given by Fernald [1950], and the citation of *Calamintha clinopodium* from Norway House by Macoun [1884] probably refers to this variety, as do the listings of *Clinopodium vulgare* by Jackson *et al.* [1922] and Lowe [1943]. No Manitoba specimens have been seen, however, and it should be excluded from our flora for the present.

## 100. SOLANACEAE

## (Nightshade Family)

1. Anthers forming a tube around the style, opening by terminal pores; corolla wheel-shaped (rotate); fruit a berry........................................1. *Solanum*
1. Anthers separate, splitting lengthwise; corolla campanulate or funnelform (rotate only in *Chamaesaracha*).
   2. Fruit a capsule opening by a lid, enclosed in the strongly ribbed and veined calyx; corolla funnelform, yellowish, strongly purplish-veined; plant clammy-pubescent........................................2. *Hyoscyamus*
   2. Fruit a berry.
      3. Corolla rotate, white with yellow eye, 3-5 cm. broad; calyx ribless and scarcely angled, obscurely veiny, closely investing the berry.............3. *Chamaesaracha*
      3. Corolla rotate-campanulate, yellowish with dark centre, smaller; calyx 5-angled, often 10-ribbed, strongly veiny, loosely covering the berry.............4. *Physalis*

### 1. SOLANUM L.

### (Nightshade)

1. Plant densely stellate-pubescent, copiously armed with yellowish awl-shaped prickles; leaves once or twice pinnatifid; flowers yellow, about 2·5 cm. broad; berry wholly enclosed by the close-fitting calyx..................................1. *S. rostratum*
1. Plant glabrous or pubescent with simple hairs, unarmed; flowers white, smaller; berry not enclosed by the calyx.
   2. Leaves deeply pinnatifid, with rounded sinuses; peduncles 1-3-flowered; berries green..........................................2. *S. triflorum*
   2. Leaves entire or merely dentate.
      3. Inflorescence mostly 5-10-flowered; berries black; leaves entire or sinuate; plant glabrous or sparingly pubescent..................................3. *S. nigrum*
      3. Inflorescence umbellate, 1-5-flowered; berries yellow or red; leaves coarsely dentate; plant villous-pubescent and somewhat viscid.........................*S. villosum*

1. **S. rostratum** Dunal (*Androcera rostrata* (Dunal) Rydb.) Buffalo-bur

Specimens have been seen from the following localities: Clearwater, about 65 miles southwest of Portage la Prairie (Ritchie, 1911); Boissevain, north of Turtle Mountain (Stevenson, 1940); Delta, near the south end of Lake Manitoba (Jackson, 1921); Cormorant, about 45 miles northeast of The Pas (Turnbull, 1933). It is a species of sandy prairie and waste places. Reported also from Baldur, Binscairth, Gladstone, Manitou, and Waskada by Lowe [1943]. First report: Jackson *et al.* [1922].

Temperate western American: Wyo. to Sask. and Man., s. to Utah, N.M., and Tex.; adventive farther eastward.

2. **S. triflorum** Nutt.

Thickets, prairie, gardens, and waste places of southern Manitoba. Northernmost collection: Dropmore, about 100 miles northwest of Brandon, dry prairie roadside (Scoggan, 1951). Earliest collection seen: Winnipeg, mouths of badger holes (Macoun, 1872). First report: near Carberry [Christy, 1887].

Temperate western American: B.C. to s. Man., s. to Calif., N.M., and Kans.; adventive farther eastward.

3. S. NIGRUM L.

Specimens have been seen from the following localities: Morris, about 35 miles south of Winnipeg (Sparling, 1937); Portage la Prairie (Macoun & Herriot, 1906); The Pas (Krivda, 1951; "Introduced from Sifton in 1930. Flourishes, but berries do not usually ripen before frost"). Sifton is about 100 miles north of Brandon. First report: Jackson *et al.* [1922].

European: naturalized in temperate North America.

*S. villosum* Mill. is represented in the herbarium of the University of Manitoba by a specimen collected at Helston, about 40 miles northeast of Brandon, by J. W. Knowsley in 1924. It does not seem to have been collected since that time and was probably merely a waif.

### 2. HYOSCYAMUS L.

1. H. NIGER L. Black Henbane

Specimens have been seen from the following localities: Boissevain, north of Turtle Mountain (Stevenson, 1945); St. Martin, about 120 miles north of Portage la Prairie (Starr, 1948); Dauphin, north of Riding Mountain (Conner, 1931). First report: "On roadside between Matlock and Whytewold, Gimli, Dauphin" [Lowe, 1943].

European: naturalized in temperate North America.

### 3. CHAMAESARACHA Gray

1. **C. grandiflora** (Hook.) Fern. (*Physalis grandiflora* Hook.; *Leucophysalis grandiflora* (Hook.) Rydb.) Large White-flowered Ground-cherry

Sandy clearings and waste ground in the southern quarter of the province. Northernmost collection: Minitonas, north of Duck Mountain (Laing, 1934). Earliest collection seen: Elk Island, near the south end of Lake Winnipeg, sandy banks (Macoun, 1884). First report: Red River, Elk Island, and "Near old encampments on the shores of Lake Winnipeg, where fires have been made." [Macoun, 1884].

Temperate American: Sask. to e. Que., s. to n. Minn., Wisc., and Vt.

### 4. PHYSALIS L.

### (Ground-Cherry)

1. Filaments slender; leaves broadly rounded to cordate at base, hoary with a dense soft pubescence; upper part of stem densely spreading-pubescent; corolla 6-10 mm. long; pedicels less than 1 cm. long; annual . . . . . . . . 1. *P. pruinosa*
1. Filaments flat and expanded; corolla 12-20 mm. long; mature pedicels 1-3 cm. long; perennials from deep-seated rhizomes.
   2. Upper part of stem sparsely pubescent with short stiff hairs; leaves gradually tapering toward base.
      3. Hairs of upper part of stem more or less recurved; fruiting calyx sunken at base . . . . . . . . 2. *P. virginiana*
      3. Hairs of upper part of stem ascending or spreading; fruiting calyx merely slightly retuse at base . . . . . . . . *P. lanceolata*
   2. Upper part of stem densely villous with soft spreading hairs; leaves broadly rounded to subcordate at base; fruiting calyx retuse at base . . . . . . . . *P. heterophylla*

1. **P. pruinosa** L. Strawberry-Tomato

Known in Manitoba only from Winnipeg, where it was collected by J. Cocks in 1910. First report: the present publication.

Temperate eastern American: s. Man. to Me., s. to Kans., Tenn., and n. Fla.

2. **P. virginiana** Mill.

Sandy prairie and clearings of southern Manitoba. Northernmost collection: Makinak, about 80 miles north of Brandon (Ducharme, 1910). Earliest collection seen: Portage la Prairie (McMorine, 1891). First report: near Carberry [Shimek, 1927]. Basis of reports of P. *lanceolata* Michx. from the province, and of the citation of *P. heterophylla* Nees from Victoria Beach by Groh & Frankton [1949].

Temperate American: s. Man. to s. Ont. and N.Y., s. to Ariz., Colo., Tex., and n. Fla.

## 101. SCROPHULARIACEAE

### (Figwort Family)

[*See* Pennell, 1935.]

1. Plant densely woolly throughout with branched hairs; anther-bearing stamens 5; corolla yellow, rotate; leaves alternate........................................1. *Verbascum*

1. Plant not woolly; anther-bearing stamens 2 or 4; corolla bell-shaped or tubular (nearly rotate in *Veronica*), more or less irregular.

    2. Stems prostrate on muddy shores, the oblong to elliptic, entire, long-petioled, fleshy leaves forming rosettes at the rooting nodes around the 1-flowered pedicels; corolla pink, nearly regular..............................................9. *Limosella*

    2. Stems erect or ascending (rarely trailing), leafy; corolla mostly more or less irregular.

        3. Leaves alternate (or the lower ones sometimes opposite or whorled).

            4. Corolla spurred on the lower side at base; anther-bearing stamens 4.

                5. Flowers solitary in the leaf-axils, lilac or blue, short-spurred.

                    6. Stem trailing, often rooting at the nodes; leaves reniform-orbicular, 5-9-lobed, slender-petioled; plant glabrous.......................*Cymbalaria*

                    6. Stem ascending, branching from near base; leaves linear to oblong, sessile; plant glandular-pubescent..........................3. *Chaenorrhinum*

                5. Flowers in terminal spike-like racemes, yellow, long-spurred.......2. *Linaria*

            4. Corolla spurless.

                7. Anther-bearing stamens 2; corolla nearly rotate, its tube very short, the lower lobe of the limb commonly the narrowest; flowers blue or nearly white..........................................................11. *Veronica*

                7. Anther-bearing stamens 4; corolla tubular or cylindric, 2-lipped, mostly yellow, sometimes purple or purple-tinged.

                    8. Leaves entire or sometimes cleft into narrow entire segments; anther-sacs unequal, the outer one attached to its filaments by the middle, the inner one hanging by its upper end and commonly smaller.

                        9. Bracts often coloured and showy, larger and more conspicuous than the flowers; upper lip of corolla longer than the lower..........13. *Castilleja*

                        9. Bracts green; upper lip of corolla about equalling the broad 3-toothed lower lip.........................................14. *Orthocarpus*

                    8. Leaves pinnately lobed or deeply toothed; anther-sacs equal and parallel..........................................20. *Pedicularis*

        3. Leaves opposite or whorled (or the upper ones sometimes alternate).

            10. Anther-bearing stamens 2.

- 11. Corolla nearly rotate, its tube very short; other characters as above............ 11. *Veronica*
- 11. Corolla cylindric.
  - 12. Flowers purplish or white, in dense terminal spike-like racemes; stamens exserted; stem essentially glabrous.................. 10. *Veronicastrum*
  - 12. Flowers yellowish to creamy-white, solitary on slender axillary pedicels; stamens included; stem and branches more or less glandular-puberulent.............................................. 8. *Gratiola*

10. Anther-bearing stamens 4.

- 13. Flowers solitary in the leaf-axils.
  - 14. Leaves shallowly toothed (if subentire, the leaves orbicular or reniform); corolla strongly 2-lipped, the upper lip covering the lower in the bud ............................................. 7. *Mimulus*
  - 14. Leaves entire (or the uppermost ones often with a pair of teeth at base); lower lip or lobe of corolla covering the upper in the bud.
    - 15. Corolla strongly 2-lipped, mostly whitish to straw-colour; capsule 1-4-seeded; leaves linear to narrowly lanceolate, short petioled.......................................... 15. *Melampyrum*
    - 15. Corolla scarcely 2-lipped, only slightly irregular, roseate to purple; capsule many-seeded; leaves linear, sessile............. 12. *Gerardia*
- 13. Flowers mostly in terminal spikes or spike-like racemes, sometimes in racemose panicles or umbels.
  - 16. Stamens 5, only 4 of them anther-bearing (the sterile filament gland-like in *Collinsia*); upper lip of corolla covering the lower in the bud.
    - 17. Corolla 4-6 mm. long, barely exceeding the calyx-lobes, the folded lower lip enclosing the stamens; flowers long-pedicelled, the upper ones, and often their subtending leaves, verticillate; weak annual plant branched from the base........................ 4. *Collinsia*
    - 17. Corolla 8 mm. long or more, the lower lip not folded.
      - 18. Flowers nearly sessile in dense spikes, creamy-white or tinged with pink; anthers densely woolly; seeds compressed, winged; plant of wet or moist shady habitats................. 5. *Chelone*
      - 18. Flowers pedicelled in racemes or racemose panicles; anthers not woolly; seeds plump, wingless; plants of dry (mostly prairie) habitats...................................... 6. *Penstemon*
  - 16. Stamens 4, all anther-bearing; lower lip of corolla covering the upper in the bud.
    - 19. Leaves entire (or the uppermost ones often with a pair of teeth at base); capsules 1-4-seeded...................... 15. *Melampyrum*
    - 19. Leaves toothed or lobed; capsules many-seeded.
      - 20. Leaves pinnately lobed (or the upper ones sometimes merely deeply toothed); capsule compressed, oblique or curved, usually opening along 1 side; calyx often 2-lipped......... 20. *Pedicularis*
      - 20. Leaves merely toothed, not lobed; capsule and calyx nearly symmetrical.
        - 21. Calyx ovate and flattened, much inflated in fruit; corolla yellow or bronze-tinged; capsule suborbicular............................................... 19. *Rhinanthus*
        - 21. Calyx tubular to bell-shaped, not inflated; corolla white, roseate, or purple; capsule elongate.
          - 22. Corolla dark purple, up to 1·7 cm. long, densely glandular-pubescent; stems crowded at summit of a stout rhizome; plant of the Hudson Bay region.............. 18. *Bartsia*
          - 22. Corolla white to roseate; stems slender, annual.
            - 23. Corolla white or purple-tinged, less than 8 mm. long, glabrous, its upper lip 2-lobed; anthers coherent; leaves palmately veined............... 16. *Euphrasia*
            - 23. Corolla roseate, about 10 mm. long, pubescent, its upper lip entire; anthers free; leaves pinnately veined .................................. 17. *Odontites*

### 1. VERBASCUM L.

1. V. THAPSUS L. Common Mullein. Flannel-plant

Specimens have been seen from the following localities: Winnipeg (Simpson, 1935); Birds Hill, near Winnipeg (Quelch, 1950); Killarney, near Turtle Mountain, shallow ravine (Budd & Lodge, 1948). It is a species of rocky open places. First report: Winnipeg and Bowsman River [Lowe 1943].

European: widely naturalized in North America.

### 2. LINARIA Mill.

### (Toadflax)

1. Leaves linear to linear-lanceolate; corolla (including spur) 2-3 cm. long, bright yellow, with rounded orange palate........................................1. *L. vulgaris*
1. Leaves oblong to ovate; corolla yellow, 3·5-4 cm. long................2. *L. dalmatica*

1. L. VULGARIS Hill (*Linaria linaria* (L.) Karst.) Butter-and-eggs

Clearings and waste ground, locally throughout the province except the extreme north. Northernmost collection: Churchill, railway tracks (Beckett, 1946). Earliest collection seen: Glenboro (unknown collector, 1914). First report: Cypress River [Jackson *et al.*, 1922].

European: widely naturalized in temperate North America.

2. L. DALMATICA (L.) Mill.

Specimens have been seen from the following localities: Winnipeg, campus (Craigie, 1927); Souris, about 20 miles southwest of Brandon, farmland (Forsyth, 1952); "Prawda district", roadside near abandoned homestead (Prodon, 1945). First report: the present publication. Basis of the citation of *L. macedonica* Griseb. from northeastern Manitoba by Groh & Frankton [1949].

European: sparingly naturalized in eastern North America.

### 3. CHAENORRHINUM Reichenb.

### (Dwarf Snapdragon)

1. C. MINUS (L.) Lange (*Linaria minor* (L.) Desf.)

Dry clearings, particularly on railway ballast, in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, sandy railway yard (Schofield, 1950). Earliest collection seen: North Kildonan, Winnipeg, railroad (Denike, 1940). First report: Morris, Victoria Beach, and Winnipeg [Lowe, 1943].

European: naturalized in eastern North America.

### ***Cymbalaria*** Hill

*C. muralis* Gaertn., Mey., & Scherb. (*Linaria cymbalaria* (L.) Mill.), Coliseum-Ivy, is represented in the herbarium of the University of Manitoba by two collections made by Jackson and Marquardt in 1931 and 1932 respectively. The Jackson collection bears the annotation "campus", and both were almost certainly obtained from cultivated plants.

### 4. COLLINSIA Nutt.

1. **Collinsia parviflora** Dougl. (*C. tenella* (Pursh) Piper, not Benth.)

A single specimen has been seen, from High Lake, on the Ontario boundary east of Winnipeg, where it was collected by Lowe in 1921. First report: Lake Winnipeg [Macoun, 1884]. Also reported from "Lake Winnipeg Valley" by Newsom in his revision of the genus [Bot. Gaz. 87: 289. 1929], based upon a collection made by Bourgeau in 1851.

(Subarctic-)temperate American: s. Alaska to s. Man. and n. Mich., s. to Calif., Ariz., Colo., and S.D.; se. Ont.; w. Vt.

### 5. CHELONE L.

### (Turtlehead)

1. **C. glabra** L. var. **linifolia** Coleman (*C. linifolia* (Coleman) Pennell) Balmony

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg (Lowe, 1940); Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1921). It is a species of low, often wet, ground, the leaves of this variety being linear-lanceolate rather than lanceolate to ovate. First report: Shoal Lake [Pennell, 1935]. Probable basis of the citation of the main form from Turtle Mountain by Macoun [1884]. The Manitoba material is referable to forma *velutina* Pennell & Wherry, with leaves minutely pubescent beneath.

Temperate eastern American: s. Man. to Ont., s. to Ia. and O. A map of the distribution is given by Pennell [1935, p. 185].

### 6. PENSTEMON Mitchell

### (Beard-tongue)

1. Plants glabrous; leaves entire.
    2. Corolla blue, 15-18 mm. long; inflorescence interrupted; capsules about 10 mm. long; stem glaucous.......................................................1. *P. nitidus*
    2. Corolla dark purplish-blue, 8-10 mm. long; inflorescence dense, only interrupted below (in large specimens); capsules about 4 mm. long; stem usually purplish-green, not glaucous.......................................................2. *P. procerus*
1. Plants glandular-pubescent, at least in the inflorescence.
    3. Corolla purple, strongly inflated; sterile filament densely long-bearded; stem-leaves entire or subentire.............................................*P. eriantherus*
    3. Corolla white, lilac or purple-tinged, the tube only slightly widening upward.
        4. Inner surface of corolla minutely glandular-puberulent, its lobes spreading; sterile filament short-bearded; stem-leaves entire or only slightly toothed......3. *P. albidus*
        4. Inner surface of corolla glandless, its lobes ascending; sterile filament long-bearded above; stem-leaves mostly with small sharp teeth..................4. *P. gracilis*

1. **P. nitidus** Dougl. (*P. acuminatus* Dougl.)

Specimens have been seen from the following localities: Assiniboine River, dry gravelly soil (Macoun, 1879; determined by Pennell); Miniota, about 50 miles west-northwest of Brandon, denuded prairie slope above

Assiniboine River (Scoggan, 1953); St. Lazare, at the mouth of Qu'Appelle River, about 75 miles northwest of Brandon (Macoun & Herriot, 1906; Scoggan, 1951, 1953, prairie sandhills). First report: various localities [Macoun, 1884]. The citation of *P. acuminatus* from Austin by Lowe [1943] is referable to *P. albidus*. The Rossburn specimen was not seen.

Temperate western American: Alta. to s. Man., s. to Wash., Wyo., and S.D.

2. **P. procerus** Dougl. (*P. micranthus* Nutt.; *P. confertus* Dougl. var. *caeruleo-purpureus* Gray) [*See* discussion of nomenclature in Pennell, 1935, pp. 202 (footnote 87) and 632; Keck, Amer. Midland Nat. 33: 144. 1945].

Specimens have been seen from the following localities: Souris Co., grassland (Walker, 1889); southwestern Manitoba (Simpson, 1939); Fort Ellice, about 70 miles northwest of Brandon (Macoun & Herriot, 1906). First report: Macoun [1884].

Subarctic western American: central Alaska and central Yukon to sw. Man., s. to n. Utah and s. Colo. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Keck [Amer. Midland Nat. 33: 145 (fig. 6). 1945].

3. **P. albidus** Nutt.

Dry prairie and sandhills in the southern third of the province. Northernmost collection: Duck Mountain, prairie (Rowe, 1950). Earliest collection seen: Souris River, gravelly hillside (Burgess, 1874). First report: Jackson *et al.* [1922]. Basis of the citation of *P. acuminatus* from Austin and of *P. eriantherus* Pursh (*P. cristatus* Nutt.) from Morden by Lowe [1943], and probable basis of the report of the latter on "Dry gravelly soil, frequent from Brandon southward and westward, on the open prairie" by Macoun [1884], and its listing by Burman [1910] and Jackson *et al.* [1922]. Probable basis of the citation of *P. pubescens* Soland. (*P. hirsutus* (L.) Willd.) from "east of Red River Prairie" by Dawson [1875].

Temperate western American: s. Alta. to s. Man., s. to Mont., N.M., and Tex. A map of the distribution is given by Pennell [1935, map 65, p. 254].

4. **P. gracilis** Nutt. (*P. glaucus* Graham)

Dry prairie, sandhills, and open ground in the southern third of the province. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, dry limestone substratum (Scoggan, 1951). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Souris River [Dawson, 1875].

Temperate western American: Alta. to Wisc., s. to N.M. and S.D.; adventive farther eastward. A map of the distribution is given by Pennell [1935, map 56, p. 235].

## 7. MIMULUS L.

(Monkey-flower)

1. Corolla blue-violet, 2-4 cm. long, the throat nearly closed by the large palate; leaves lanceolate to oblong, sessile; stem erect, square in cross-section...........1. *M. ringens*
1. Corolla yellow, 8-12 mm. long, with open throat; leaves oval-cordate to reniform, short-petioled or the upper sessile; stem diffuse................2. *M. glabratus* var. *fremontii*

### 1. **M. ringens** L.

Swampy ground and shores in the southern half of the province. Northernmost collection: Hill Lake, north of Lake Winnipeg, limestone shingle at entrance of Minago River (Scoggan, 1948). Earliest collection seen: Selkirk, about 15 miles northeast of Winnipeg, wet places (Macoun, 1884). First report: Burman [1910].

Temperate eastern American: central Man. to N.S., s. to Colo., Tex., and Ga. A map of the distribution, on which a northern extension of range should be indicated by a dot for the Hill Lake locality, is given by Pennell [1935, map 24, p. 125].

### 2. **M. glabratus** HBK. var. **fremontii** (Benth.) Grant (var. *jamesii* (T. & G.) Gray; *M. geyeri* Torr.)

Known in Manitoba only from Aweme, where it was first collected by N. Criddle in 1905 in running water below a bank of the Souris River. First report: Aweme [Grant, Ann. Mo. Bot. Gard. 11: 191. 1924]. Cited also from Notre Dame de Lourdes by Lowe [1943].

Temperate American: Mont. to s. Man. and Ont., s. to Ariz., Tex., Mex., Mo., and Ill. A map of the distribution is given by Pennell [1935, map 23, p. 117].

## 8. GRATIOLA L.

(Hedge-hyssop)

### 1. **G. neglecta** Torr. (*G. virginiana* of auth., not L.; *G. lutea* Raf., in part)

Specimens have been seen from the following localities: Winnipeg (several collections, the first by Neatby in 1928, wet field); Arnaud, about 40 miles south of Winnipeg, low, wet area (Campbell, 1939); Morris, about 35 miles south of Winnipeg, wet ditch (Scoggan, 1953); Darlingford, about 50 miles south of Portage la Prairie (Simpson, 1939); Cartwright, east of Turtle Mountain, alkaline prairie flats (Scoggan, 1953, in carpet of *Eleocharis acicularis*); Killarney, near Turtle Mountain, muddy places near lake (Macoun, 1896); Foxwarren, about 70 miles northwest of Brandon (Laycup, 1923). First report: Pennell [1935; map 12, p. 80 (f.), showing stations near the south end of Lake Winnipeg and near Turtle Mountain]. Basis of the citation of *Veronica scutellata* L. from Darlingford and of *Steironema quadriflorum* (Sims) Hitchc. from Foxwarren by Lowe [1943], and of *G. virginiana* L. from the province by Dawson [1875], Macoun [1884], Burman [1910], and Jackson *et al.* [1922].

Temperate American: B.C. to Que., s. to Calif., Tex., and Ga. The distribution is shown on the above-noted map of Pennell.

## 9. Limosella L.

### (Mudwort)

1. **L. aquatica** L.

Specimens have been seen from the following localities: Morris, about 35 miles south of Winnipeg, wet ditch (Scoggan, 1953); Winnipeg, cold spring water (Denike, 1941); Victoria Beach, about 55 miles north-northeast of Winnipeg (Simpson, 1940); Miami, about 40 miles south of Portage la Prairie (Jackson, 1932); Brandon, muddy place (Macoun, 1896); Norway House, near the northeast end of Lake Winnipeg, shallow water and muddy shore (Scoggan, 1948); York Factory, shallow pools in landslide gully (Scoggan, 1949); Churchill, shallow pools (Porsild, 1930). First report: York Factory [Jackson *et al.*, 1922].

Subarctic circumpolar: Seward Pen., Alaska, to Great Bear L., central Keewatin, se. Lab., and Nfld., s. to Calif., N.M., Minn., James Bay, and e. Que.; southern half of Greenland; Iceland; n. Eurasia. A map of the American distribution (incomplete in the north) is given by Pennell [1935, map 32, p. 165].

## 10. Veronicastrum Fabricius

1. **V. virginicum** (L.) Farwell (*Veronica virginica* L.; *Leptandra virginica* (L.) Nutt.) Culver's-root

Specimens have been seen from the following localities: Lake Winnipeg Valley (Bourgeau, 1859); Greenridge, about 50 miles south-southeast of Winnipeg (Knox, 1927); Arnaud, about 40 miles south of Winnipeg, roadside (Campbell, 1939). First report: Winnipeg [Jackson *et al.*, 1922].

Temperate eastern American: se. Man. to Ont. and Vt., s. to e. Tex. and n. Fla. A map of the distribution is given by Pennell [1935, map 86, p. 324].

## 11. Veronica L.

### (Speedwell)

1. Flowers solitary in the axils of alternate upper leaves or bracts.
  2. Bracteal leaves much smaller than the opposite stem-leaves below them; pedicels mostly 2-4 mm. long; perennial, with creeping mat-forming stems..... *V. serpyllifolia*
  2. Bracteal leaves merging progressively in size with the normal foliage leaves; plants annual.
    3. Pedicels about 1 mm. long; leaves mostly sessile and subentire; stem and capsules more or less glandular-pubescent..................1. *V. peregrina* var. *xalapensis*
    3. Pedicels filiform and elongate; leaves coarsely toothed, mostly petioled; plants non-glandular.
      4. Corolla much exceeding the calyx; longer fruiting pedicels 1·3-2·7 cm. long; seeds about 8 in each locule, 1·8-2·5 mm. long..................2. *V. persica*
      4. Corolla only slightly exceeding the calyx; longer fruiting pedicels 5-12 mm. long; seeds 9-12 in each locule, 1·3-1·5 mm. long........................3. *V. polita*
1. Flowers racemose in the axils of some opposite leaves, subtended by small narrow bracts.
  5. Leaves linear to linear-lanceolate, entire or minutely toothed; racemes with filiform zigzag rachis and filiform divergent to reflexed pedicels; capsules broader than high ..............................................................4. *V. scutellata*

5. Leaves lanceolate to narrowly ovate, crenate or serrate; racemes with straight or arching rachis and divergent to spreading-ascending pedicels; capsule about as broad as high.
    6. Leaves of flowering-stems distinctly short-petioled; corolla lilac to violet.......... ..........5. *V. americana*
    6. Leaves of flowering-stems sessile, at least the upper cordate-clasping; corolla whitish or pale rose..........6. *V. salina*

1. **V. peregrina** L. var. **xalapensis** (HBK.) St. John & Warren Neckweed. Purslane-Speedwell

Moist to wet or marshy ground in the southern three-quarters of the province. Northernmost collection: York Factory, clay soil of landslide gully (Scoggan, 1949). Earliest collection seen: Fort Garry (Schultz, 1861). First report: several localities [Pennell, 1935]. Basis of reports of the main form from the province.

Subarctic American: central Yukon to n. Man., James Bay, and Que., s. throughout the United States and Mexico to Central and South America. A map of the North American distribution is given by Pennell [1935, map 87, p. 338].

2. V. PERSICA Poir. Bird's-eye

Specimens have been seen from the following localities: Portage la Prairie (McMorine, 1896; Macoun & Herriot, 1906); Dauphin, north of Riding Mountain (Groh, 1921). First report: "Manitoba" [Pennell, 1935].

Eurasian: naturalized in North America.

3. V. POLITA Fries

Represented in the herbarium of the Division of Botany and Plant Pathology, Department of Agriculture, Ottawa, by a specimen from Cartwright, east of Turtle Mountain, where it was collected in a garden by J. Fletcher in 1895. First report: Cartwright [Boivin, Naturaliste Canadien 79: 175. 1952]. Basis of the citation of *V. persica* from Cartwright by Groh & Frankton [1949].

European: naturalized in North America.

4. **V. scutellata** L. Marsh-Speedwell

Specimens have been seen from the following localities: Caddy Lake, near the Ontario boundary east of Winnipeg (Leach, 1939); Winnipeg (Lowe, 1909; Neatby, 1928; Denike, 1943); Birds Hill, near Winnipeg, boggy places (Macoun, 1896); Portage la Prairie (McMorine, 1896); Killarney, near Turtle Mountain, marsh (Macoun, 1896); Norway House, near the northeast end of Lake Winnipeg, wet woods (Scoggan, 1948); Gillam, about 165 miles south of Churchill (Schofield, 1950); Nueltin Lake, lat. 59° 43′ N., muddy bank of pool (Baldwin, 1951). First report: Burman [1910].

Subarctic circumpolar: south-central Yukon to n. Man., north-central Lab., and Nfld., s. to Calif., Colo., Ia., and Va.; Iceland; Eurasia. A map of the American distribution is given by Pennell [1935, map 90, p. 371].

Forma *alba* Boivin [Naturaliste Canadien 79: 175. 1952], with white petals, was collected by Breitung in 1949 along the shore of Sasaginnigak Lake, about 125 miles northeast of Winnipeg.

Forma *villosa* (Schum.) Pennell (var. *villosa* Schum.), with stem and leaves more or less villous, was collected by the writer in 1949 near the edge of a pond on Duck Mountain.

5. **V. americana** (Raf.) Schwein. American Brooklime

Specimens have been seen from the following localities: Victoria Beach, about 55 miles north-northeast of Winnipeg (Simpson, 1935); Treesbank, about 20 miles southeast of Brandon, swampy grassland (Bell, 1950); Brandon (Macoun, 1896, ravine; Marshall, 1947, shallow water on mud); Fort Ellice, about 70 miles northwest of Brandon (Macoun & Herriot 1906); Riding Mountain, gravel floodplain of stream (Scoggan & Baldwin, 1950). First report: Burman [1910].

Subarctic American: central Alaska to s. James Bay and Nfld., s. to s. Calif., Mex., Neb., and N.C. A map of the distribution is given by Pennell [1935, map 88, p. 354].

6. **V. salina** Schur (Glabrous forms: *V. catenata* Pennell; *V. connata* ssp. *glaberrima* Pennell; *V. comosa* var. *glaberrima* (Pennell) Boivin; glandular forms: *V. catenata* ssp. *glandulosa* (Farwell) Pennel; *V. connata* of auth., perhaps not Raf.; *V. comosa* var. *glandulosa* (Farwell) Boivin). Water-Speedwell

Muddy shores and shallow water of southern Manitoba. Northernmost collection: Dropmore, about 100 miles northwest of Brandon, shallow water of Assiniboine River (Scoggan, 1951). Earliest collection seen: Killarney, near Turtle Mountain, shore of Pembina River (Macoun, 1896). First report: (*V. connata*) "Winnipeg Valley"; (*V.* connata ssp. *glaberrima*) Killarney [Pennell, 1935]. Probable basis of the citation of *V. anagallis* from Winnipeg by Bourgeau [in Palliser, 1863], and the listing of *V. anagallis-aquatica* by Jackson *et al.* [1922]. The writer here follows Fernald [1950] and Gleason [1952] in considering the glabrous and glandular forms as being merely extremes of a single entity.

Temperate circumpolar: Sask. to sw. Que., s. to Calif., Okla., and Pa.; Eurasia. A map of the American distribution is given by Pennell [1935, map 89, p. 366; both glabrous and glandular forms].

*V. serpyllifolia* L., Thyme-leaved Speedwell, a Eurasian species, is cited from Warren Landing by Lowe [1920]. No specimens have been seen, and it should be excluded from our flora for the present.

*V. sessilifolia* L.: the citation from "Winipeg" by Bourgeau [in Palliser, 1863] is almost certainly referable to one of the above species.

## 12. GERARDIA L.

## (Gerardia)

1. Fruiting pedicels 2-5 mm. long; capsule globose, 4·5-6 mm. long.......1. *G. paupercula*
1. Fruiting pedicels mostly twice to several times as long as the capsule.
   2. Pedicels stout, about twice the length of the ellipsoid or ellipsoid-ovoid capsule, they and the branches suberect; corolla 2-2·5 cm. long; stem and leaves harshly scabrous.........2. *G. aspera*

2. Pedicels filiform, several times as long as the globose capsule; corolla 1-1·5 cm. long; stem and leaves less scabrous.
   3. Calyx-teeth 0·2-1 mm. long; capsules 3-5 mm. long; pedicels and branches spreading ........ 3. *G. tenuifolia*
   3. Calyx-teeth 1-2 mm. long; capsules usually 5-7 mm. long; pedicels and branches ascending........ 3a. *G. tenuifolia* var. *parviflora*

1. **G. paupercula** (Gray) Britt. (*Agalinis* paupercula (Gray) Britt.; incl. var. *borealis* (Pennell) Deam)

Specimens have been seen from the following localities: Stony Mountain near Winnipeg, slope of gravelly hill (Garton, 1946); "Lake of the Woods, Man.", low ground (Dawson, 1873). First report: "Norway House to Canada" [Pennell, 1935]. The citation from Morden by Lowe [1943] is referable to *G. aspera.*

Temperate eastern American: se. Man. to sw. N.B., s. to e. Ia. and Pa. A map of the distribution, on which the occurrence of the species in southeastern Manitoba should be indicated, is given by Pennell [1935, map 114, p. 434].

2. **G. aspera** Dougl. (*Agalinis aspera* (Dougl.) Britt.)

Specimens have been seen from the following localities: Stony Mountain near Winnipeg (Macoun, 1896, rocky ground; Fowler, 1953); Morden, about 60 miles southwest of Winnipeg, sandy soil (Marshall, 1939); Portage la Prairie (McMorine, 1891, 1897). First report: Emerson and Stony Mountain [Pennell, Proc. Acad. Nat. Sci. Phila. 81: 143. 1929]. Basis of the citation of *Agalinis paupercula* var. *borealis* from Morden by Lowe [1943].

Temperate (interior) American: s. Man. to Ill., s. to Okla. and Mo. A map of the distribution is given by Pennell [1935, map 112, p. 429].

3. **G. tenuifolia** Vahl var. **parviflora Nutt.** (*Agalinis tenuifolia* (Vahl) Raf. subsp. *parviflora* (Nutt.) Pennell)

Specimens have been seen from the following localities: Lake Winnipeg area (Simpson, 1941); "Dugald's Ditch" (probably near Dugald, about 10 miles east of Winnipeg) ("W.N.D.", 1945, in mud). First report: Stony Mountain, near Winnipeg [Pennell, 1935]. Basis of reports of the main form from the province, and of *Collinsia parviflora* Dougl. from around Lake Winnipeg by Lowe [1943].

Temperate American: Wyo. to s. Man. and Vt., s. to Colo., Okla., Mo., and N.Y. A map of the distribution is given by Pennell [1935, map 131, p. 459].

### 13. CASTILLEJA Mutis

### (Painted-cup)

1. Leaves and bracts cleft into linear or linear-lanceolate segments.
   2. Bracts green, shorter than the flowers; stems very leafy, 1·5-3 dm. high, clustered........ 1. *C. sessiliflora*
   2. Bracts bright scarlet toward summit (or yellow or white in forms), about equalling the flowers; stems less leafy, 3-6 dm. high, solitary........ 2. *C. coccinea*
1. Leaves entire; bracts normally with 2 narrowly linear lateral lobes.

3. Leaves lanceolate, strongly 3-ribbed; bracts tipped with scarlet or brick-red; stems up to 6 dm. high; plant of the southern and low-central regions........3. *C. miniata*
3. Leaves linear, obscurely or not at all 3-ribbed; bracts violet-purple; stems usually lower; plant of the Hudson Bay and low-northern regions...............4. *C. raupii*

1. **C. sessiliflora** Pursh. Downy Painted-cup

Dry prairie of southern Manitoba. Northernmost collection: Birtle, about 60 miles northwest of Brandon (Dudley, 1930). Earliest collection seen: Souris River, dry bank (Burgess, 1874). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Temperate western American: Sask. to s. Man. and Wisc., s. to Ariz., Tex., and Mo. A map of the distribution is given by Pennell [1935, map 150, p. 524].

2. **C. coccinea** (L.) Spreng. Scarlet Painted-cup

Thickets, meadows, and prairie of southern Manitoba. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, limestone substratum (Scoggan, 1951). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, gravelly ridge (Burgess, 1873). First report: east of Red River (yellow variety) [Dawson, 1875].

Temperate eastern American: s. Man. to Ont. and Mass., s. to Okla., La., and n. Fla. A map of the distribution is given by Pennell [1935, map 155, p. 536].

Forma *lutescens* Farw., with yellow floral bracts, is of common occurrence in the Manitoba area.

3. **C. miniata** Dougl.

Light woods, thickets, and meadows in the southern two-fifths of the province. Northernmost collection: 18 miles north of The Pas, clayey roadside, road to Lake Atikameg (Krivda, 1954). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Carberry and vicinity [Christy, 1887]. Basis of reports of *C. rhexifolia* Rydb. from the province, and probable basis of most citations of *C. acuminata* (Pursh) Spreng. from southern Manitoba. The citation of the latter from Churchill by Lowe [1943] is referable to the following species.

(Subarctic-)temperate western American: s. Alaska and n. B.C. to south-central Man., s. to Oreg., Ida., and Mont. A map of the Canadian distribution is given by Cody [Can. Field-Nat. 70: 124 (fig. 1). 1956].

4. **C. raupii** Pennell [*See* Pennell, Proc. Acad. Nat. Sci. Phila. 86: 528. 1934]

Shores and open ground in the northern third of the province. Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill, railway embankment (Schofield, 1950); Hayes River, near the mouth of Fox River, about 100 miles southwest of York Factory, clay-gravel beach (Scoggan, 1941); Hayes River, island about 40 miles southwest of York Factory, clay-gravel floodplain (Scoggan, 1949); York Factory (McTavish, 1853-54; Scoggan, 1949, clay flats and gravel beaches); Nelson River opposite Gillam Island, about 20 miles west-southwest of

York Factory, gravel beach (Scoggan, 1949); Churchill (many collections, the first by McTavish in 1853). First report: Churchill [Pennell, Proc. Acad. Nat. Sci. Phila. 86: 530 (map 2). 1934]. Basis of the citation of *C. rhexifolia* from Churchill by Lowe [1943] and of *C. pallida* (L.) Spreng. ssp. *elegans* (Ostenfeld) Pennell from Churchill by Pennell [1934]. Probable basis of citations of *C. pallida* and its var. *septentrionalis* (Lindl.) Gray from northern Manitoba.

Subarctic American: central Alaska to central Mack. and n. Man., s. to n. B.C. and s. James Bay. A map of the distribution is given by Pennell [1934, map 2, p. 530].

### 14. ORTHOCARPUS Nutt.

1. **O. luteus** Nutt.

Dry prairie and clearings in the southern half of the province. Northernmost collection: Norway House, near the northeast end of Lake Winnipeg, open ground near Hudson's Bay Co. trading post (Scoggan, 1948). Earliest collection seen: Oak Point, about 55 miles northwest of Winnipeg (Macoun, 1872). First report: various localities [Macoun, 1884].

Temperate western American: s. B.C. and central Alta. to s. Man., s. to Calif., N.M., and sw. Minn. A map of the distribution is given by Pennell [1935, map 149, p. 517].

### 15. MELAMPYRUM L.

(Cow-wheat)

1. **M. lineare** Desr.

Dry conifer woods in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, white spruce woods (Scoggan, 1949). Earliest collection seen: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1919). First report: Shoal Lake [Pennell, 1935].

(Subarctic-)temperate American: central B.C. and n. Alta. to central Man., s. Lab., and Nfld., s. to Wash. and N.E. A map of the distribution is given by Pennell [1935, map 148, p. 508].

### 16. EUPHRASIA L.

(Eyebright)

1. Teeth of floral-bracts bristle-tipped....................1. *E. hudsoniana*
1. Teeth of floral-bracts obtusish or merely acute....................2. *E. arctica*

1. **E. hudsoniana** Fern. & Wieg.

Specimens appearing referable here have been seen from the following localities: Grand Rapids, near the northwest end of Lake Winnipeg (Scoggan, 1948, limestone-cobble beach; cleared land; swampy ground); Norway House, near the northeast end of Lake Winnipeg, muddy shore (Scoggan, 1948); York Factory, clay of landslide gully (Scoggan, 1949); Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915); Churchill (Beckett, 1953). First report: the present publication.

(Arctic-)subarctic American: Alta. to n. Man., south-central Baffin I., n. Que., n. Lab., and Nfld., s. to ne. Minn., L. Sup., and e. Que.

2. **E. arctica** Lange (Incl. *E. disjuncta* Fern. & Wieg.)

Specimens appearing referable here have been seen from the following localities: Hayes River (Scoggan, 1949, banks above Knee Lake; rocky shore between Swampy Lake and Brassey Hill; clay-gravel beach opposite mouth of Fox River); Gillam, about 165 miles south of Churchill (Gillett, 1948, railway clearing; Schofield, 1950, moist soil); Nelson River (Scoggan, 1949, cobble beach at mouth of Roblin River; gravel beach 10 miles above Gillam Island; clearing by cabin at Mile 352, Hudson Bay Railway); York Factory (Scoggan, 1949, open ground; gravel beach and floodplain of Hay Island; clay flats of Marsh (Beacon) Point); Churchill (Macoun, 1910; Beckett, 1946, tundra; Gillett, 1948, gravel area); Nueltin Lake, lat. 59° 48′ N., gravel spit (Baldwin, 1951). First report: Churchill [Lowe, 1943]. Probable basis of citations of *E. officinalis* L. from "Shore of Hudson's Bay at York Factory and Fort Churchill" by Bell [1884] and from near York Factory by Richardson ["H", in Franklin, 1823].

(Arctic-)subarctic amphi-Atlantic: Seward Pen., Alaska, to central Mack., n. Man., south-central Baffin I., n. Que., n. Lab., and Nfld., s. to s. Alta., n. Mich., and n. Me.; Europe.

### 17. ODONTITES Ludwig

1. O. SEROTINA (Lam.) Dum. (*O. rubra* Gilib.) Red Bartsia

Known in the province only from near Gimli, about 45 miles north of Winnipeg, where it was collected in 1954 by B. Petursson, with the note "recently introduced weed". First report: the present publication.

European: sparingly naturalized in eastern North America.

### 18. BARTSIA L.

1. **B. alpina** L. Velvet-bells. Alpine Bartsia

Known in Manitoba only from Churchill, the earliest collection seen from there having been made by Macoun in 1910. It is a species of barren northern habitats. First report: between York Factory and Churchill [Rae, 1850].

(Arctic-)subarctic ?circumpolar: gap in western N. Am.; n. Man. to s. Baffin I., n. Que., and n. Lab., s. to s. James Bay and Nfld.; Greenland; Iceland; n. Eurasia.

### 19. RHINANTHUS L.

(Yellow-rattle)

1. Teeth of at least the basal part of the floral-bracts lance-attenuate and bristle-tipped, up to 5 mm. long; corolla about 1·5 cm. long; leaves lance-attenuate or narrowly oblong-lanceolate, tapering gradually from base to acutish apex . . . . . . . . . . . . . 1. *R. crista-galli*

1. Teeth of floral-bracts deltoid, blunt to acutish, short; corolla 1-1·2 cm. long; leaves oblong-linear to oblong-lanceolate or oblong, obtuse or rounded at apex; plant of the Hudson Bay and northern regions..................................2. *R. borealis*

1. **R. crista-galli** L. (Incl. *R. kyrollae* Chabert)

Specimens have been seen from the following localities: Lake Winnipegosis, trail at East Mossy Portage (Scoggan, 1948); Grand Rapids, near the northwest end of Lake Winnipeg (Jackson, 1925; Scoggan, 1948, clearing on limestone substratum and swampy ground below rapids); Cross Lake, northeast of Lake Winnipeg (Scoggan, 1948, clearing and portage in woods); Oxford Lake, clearing (Scoggan, 1949); Hayes River opposite mouth of Fox River, clay-gravel beach (Scoggan, 1949); Gillam, about 165 miles south of Churchill, railway clearing (Gillett, 1948); York Factory, clay of landslide gully (Scoggan, 1949); Nelson River, cobble beach at mouth of Roblin River (Scoggan, 1949). First report: near York Factory ["H", Richardson, in Franklin, 1823].

(Subarctic-)temperate circumpolar: n. Alta. to n. Man. and Nfld., s. to L. Sup. and s. Me.; Eurasia.

2. **R. borealis** (Sterneck) Chabert (*R. groenlandicus* Chabert; *R. minor* L. subsp. *groenlandicus* (Chab.) Neum.; *R. oblongifolius* Fern.)

Specimens have been seen from the following localities: Norway House, near the northeast end of Lake Winnipeg, clearing (Scoggan, 1948); Gillam, about 165 miles south of Churchill, moist grassy areas (Schofield, 1950); York Factory (McTavish, undated, but probably 1853–54; Scoggan, 1949, open ground near Hudson's Bay Co. trading post and clay flats of Marsh (Beacon) Point); Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915); Churchill (Macoun, 1910; Polunin, 1936; Buller, 1939; Beckett, 1948, among mosses in damp places; Gillett, 1948, gravel). First report: Lowe [1943; based upon the inclusion of Manitoba in the range by Rydberg, 1932]. Basis of the citation of *Alectorolophus minor* from Churchill by Gröntved [1936].

Subarctic ?circumpolar (with large gaps): Seward Pen., Alaska, to se. Keewatin, n. Que., n. Lab., and Nfld., s. to s. Alta., James Bay, and n. N.E.; s. Greenland; Iceland; nw. Europe; e. Asia. A map of the distribution is given by Löve [Botaniska Notiser, 1950, fig. 18, p. 52], to which, as here interpreted, should be added the Scandinavian area shown in his fig. 17, p. 51, for *R. groenlandicus.*

## 20. PEDICULARIS L.

(Lousewort. Wood-betony)

1. Plants of the southern and south-central regions; flowers yellow.
    2. Leaves doubly cut-toothed, partly opposite, sessile, their margins cartilaginous; upper lip of corolla entire; capsule ovoid, scarcely longer than the calyx; plant essentially glabrous..................................1. *P. lanceolata*
    2. Leaves pinnately parted, alternate, most of them petioled; upper lip of corolla with 2 subterminal teeth; capsule lance-oblong, flattened, twice as long as the calyx; plant abundantly hairy, particularly in the inflorescence..................2. *P. canadensis*

1. Plants of the Hudson Bay and low-northern regions; flowers yellow or purple; leaves mostly pinnately parted.
   3. Galea (upper hooded lip of corolla) produced into a long filiform beak which is decurved against the lower lip and upwardly recurved beyond it; corolla red or purple; plant glabrous........................................3. *P. groenlandica*
   3. Galea short-beaked or beakless.
      4. Flowers purple, axillary or in few-flowered loose terminal spikes....4. *P. parviflora*
      4. Flowers all in rather compact terminal spikes.
         5. Flowers purple; inflorescence densely yellowish-woolly; leaves chiefly basal..........5. *P. sudetica*
         5. Flowers yellow, often purple-tinged; stems relatively leafy; plants glabrous or merely puberulent above.
            6. Galea tipped by a conical beak about 1 mm. long; flowers uniformly yellow..........6. *P. lapponica*
            6. Galea beakless.
               7. Galea 2-toothed on the lower side at apex, yellow or purple-tinged..........7. *P. labradorica*
               7. Galea entire, tipped with purplish-black....................8. *P. flammea*

1. **P. lanceolata** Michx.

Moist ground of southern Manitoba. Northernmost collection: Ochre River, about 85 miles north of Brandon, grassy clearing (Scoggan, 1951). Earliest collection seen: Fort Garry (Macoun, 1872). First report: "Rich, damp prairie, White Horse Plains, and low rich prairie near Brandon, Man." [Macoun, 1884].

Temperate eastern American: s. Man. to s. Ont. and Mass., s. to Neb., Tenn., and N.C. A map of the distribution is given by Pennell [1935, map 146, p. 495].

2. **P. canadensis** L. Common Lousewort. Wood-betony

Woods and clearings of southern Manitoba. Northernmost collection seen: Moosehorn, about 90 miles north of Portage la Prairie, edge of woods (Scoggan, 1951); but reported from Grand Rapids, near the northwest end of Lake Winnipeg, by Macoun [1884]. Earliest collection seen: Manitoba House, near "The Narrows" of Lake Manitoba (Macoun, 1881). First report: "Winipeg" [Bourgeau, in Palliser, 1863]. The citation from Churchill by Lowe [1943] is referable to *P. labradorica.*

Temperate eastern American: Man. to s. Que., s. to Colo., Tex., Fla., and n. Mex. A map of the distribution is given by Pennell [1935, map 147, p. 499].

3. **P. groenlandica** Retz. (*Elephantella groenlandica* (Retz.) Rydb.)

Specimens have been seen from the following localities: Hayes River (Scoggan, 1949, clay-gravel beach opposite the mouth of Fox River); York Factory, gravel beach and floodplain of Hay Island (Scoggan, 1949); Nelson River (Scoggan, 1949, gravel beach opposite Gillam Island and 10 miles above Gillam Island); Limestone River near its confluence with Nelson River, about 160 miles south of Churchill (Schofield, 1950); Churchill (Cairnes, 1915; MacKinnon, 1947, edge of muskeg). First report: York Factory [Bell, 1881].

(Arctic-)subarctic American: B.C. to n. Alta., n. Que., and n. Lab., s. to Calif., N.M., Sask., James Bay, and s. Lab.; sw. Greenland. Some doubt has been expressed by recent authors as to the occurrence of this species in Greenland [*see* Polunin, 1940, p. 329, footnote 1], but there is a specimen in the National Herbarium of Canada collected in the Godthaab district by Porsild in 1941.

4. **P. parviflora** Sm.

Specimens have been seen from the following localities: Kettle Rapids of the Nelson River, about 160 miles south of Churchill (Emerton, 1917); York Factory (Bell, 1880; Scoggan, 1949, muskeg forest of black spruce and tamarack). First report: "Northern Manitoba" [Lowe, 1943]. Undoubtedly the basis of the citation of *P. wlassoviana* (*P. palustris* var. *wlassoviana* Bunge) from between York Factory and Churchill by Rae [1850] and from York Factory by Bell [1881], and of *P. macrodontis* Richards. from near York Factory by Richardson ["H", in Franklin, 1823].

Subarctic American: central Alaska to n. Ont., s. to central B.C., south-central Sask., and s. James Bay. Closely related to the Alaskan *P. pennellii* Hult., and to *P. palustris* of eastern North America and Europe.

5. **P. sudetica** Willd.

Specimens have been seen from the following localities: "Northern Manitoba" (Copeland, 1941, tundra; probably near Churchill); Churchill (several collections, the earliest seen from there being made by Macoun in 1910); Mosquito Point, 7 miles north of Churchill (Porsild, 1930, open forest and muskegs, river-banks). First report: between York Factory and Churchill [Rae, 1850]. Basis of the citation of *P. arctica* R. Br. from Churchill by Lowe [1943].

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to Melville I. and Devon I.), s. to central B.C., n. Man., and James Bay; n. Eurasia (gap in w. Europe). A map of the American distribution is given by Raup [1947, pl. XXXIV].

6. **P. lapponica** L.

Specimens have been seen only from Churchill, the earliest collection seen from there having been made by Macoun in 1910. Reported also from Mile 445 of the Hudson Bay Railway (about 65 miles south of Churchill) by Størmer [1933]. First report: between York Factory and Churchill [Rae, 1850].

(Arctic-)subarctic circumpolar: n. Alaska to n. Mack., central Keewatin, south-central Baffin I., n. Que., and n. Lab., s. to Great Bear L., n. Man., James Bay, and s. Lab.; southern half of Greenland; n. Eurasia.

7. **P. labradorica** Wirsing (*P. euphrasioides* Stephen)

Specimens have been seen from the following localities: Churchill (several collections, the earliest seen from there being made by Macoun in 1910); Mosquito Point, 7 miles north of Churchill (Porsild, 1930);

Nejanilini Lake, lat. 59° 22′ N., marshy ground (Scoggan & Baldwin, 1950); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: between York Factory and Churchill [Rae, 1850; *P. euphrasioides*].

(Arctic-)subarctic ?circumpolar: n. coast of Alaska, Yukon, and Mack. to s. Baffin I., n. Que., and n. Lab., s. to s. B.C., James Bay, and s. Lab.; sw. Greenland; n. Asia. A map of the American distribution is given by Raup [1947, pl. XXXIV].

8. **P. flammea** L.

Known in Manitoba only from Churchill, the earliest collection seen from there having been made by Macoun in 1910. First report: between York Factory and Churchill [Rae, 1850].

Arctic amphi-Atlantic: Great Bear L. and n. coast of Mack. to Devon I., n. Que., and n. Lab., s. to s. B.C., n. Man., James Bay, e. Que., and Nfld.; n. Scandinavia.

### *Scrophularia* L.

### (Figwort)

*S. marilandica* L., Carpenter's-square, is cited from near Aweme by Criddle [1927], and is listed, without locality, by Lowe [1943], probably on the basis of the inclusion of Manitoba in the range by Rydberg [1932]. No specimens have been seen, however, nor is Manitoba included in the map of the distribution given by Pennell [1935, map 79, p. 285]. It should be excluded from our flora for the present.

## 102. OROBANCHACEAE

### (Broom-rape Family)

### 1. OROBANCHE L.

### (Broom-rape)

1. Flowers on naked axillary pedicels 3-12 cm. long; lobes of corolla obtuse; lobes of calyx triangular-lanceolate, equalling or shorter than the tube................1. *O. fasciculata*
1. Flowers numerous in dense terminal spike-like racemes, only the lowest on pedicels up to 1 cm. long, each with 1 or 2 basal bracts; lobes of corolla acute; lobes of calyx linear-lanceolate, longer than the tube............................2. *O. ludoviciana*

1. **O. fasciculata** Nutt. (*Anoplanthus fasciculatus* (Nutt.) Walp.; *Aphyllon fasciculatum* (Nutt.) Gray; *Thalesia fasciculata* (Nutt.) Britt.)

Specimens have been seen from the following localities: Neepawa, about 30 miles north-northeast of Brandon (Grant, 1924); Carberry, about 25 miles east of Brandon (Cope, undated); Brandon (Marshall, 1950, sandy hill; Stevenson, 1953, dry sandy hills, parasitic on *Artemisia frigida*); Souris Plains (Macoun, 1883); Harding, about 30 miles west-northwest of Brandon (Scott, 1924); Lauder, about 45 miles southwest of Brandon, sandhills (Scoggan, 1953); Oak Lake, about 30 miles west of Brandon, sandy prairie (Scoggan, 1953); Routledge, about 40 miles west of Brandon, sandhills (Scoggan, 1953). First report: Burman [1910].

(Subarctic-)temperate American: south-central and s. Yukon; s. B.C. to central Alta. and s. Man., s. to Calif., N.M., Neb., and Ind.

2. **O. ludoviciana** Nutt. (*Myzorrhiza ludoviciana* (Nutt.) Rydb.)

Specimens have been seen from the following localities: Aweme, about 20 miles southeast of Brandon (Criddle, 1899); Lauder, about 45 miles southwest of Brandon, prairie sandhills (Scoggan, 1951); Oak Lake, about 30 miles west of Brandon, prairie sandhills (Scoggan, 1951). Cited also from Virden by Lowe [1943]. First report: near Carberry [Christy, 1887].

Temperate American: B.C. to sw. Man., s. to Tex., Kans., Minn., Ind., and O.

## 103. LENTIBULARIACEAE

(Bladderwort Family)

1. Flowers violet, solitary on naked scapes; leaves elliptic to ovate, entire, borne in a basal rosette; plants of the Hudson Bay and northern regions...............1. *Pinguicula*

1. Flowers yellow, 1-few on bracted scapes; leaves finely dissected, bladder-bearing, immersed..........................................................2. *Utricularia*

### 1. PINGUICULA L.

(Butterwort)

1. Scapes densely hairy; corolla pale violet, 8-12 mm. long...................1. *P. villosa*

1. Scapes glabrous; corolla violet-purple, 1·5-2 cm. long...................2. *P. vulgaris*

1. **P. villosa** L.

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill (Simpson, 1942; Schofield, 1950, sphagnum hummocks); Churchill (Gillett, 1948, in sphagnum; Dore, 1949, wet mossy tundra); Reindeer Lake, lat. 57° 37′ N., sphagnum bog (Baldwin, 1951); Nueltin Lake, lat. 59° 48′ N., boggy ground (Baldwin, 1951); Baralzon Lake, lat. 60° N., hummocky sedge-heath tundra (Scoggan & Baldwin, 1950). First report: Churchill [Lowe, 1943].

(Arctic-)subarctic circumpolar: n. Alaska, n. Yukon, and nw. Mack. to south-central Keewatin, n. Que., and n. Lab., s. to Vancouver I., n. Alta., and s. Lab.; n. Eurasia (with large gaps). A map of the American distribution, on which the occurrence of the species in northern Manitoba should be indicated, is given by Raup [1947, pl. XXXIV].

2. **P. vulgaris** L.

Specimens have been seen from the following localities: Gillam, about 165 miles south of Churchill (Schofield, 1950); Limestone River near its confluence with the Nelson River (Schofield, 1950); Nelson River near the mouth of Roblin River, gravel beach (Scoggan, 1949); York Factory (Scoggan, 1949, gravel beach and floodplain of Hay Island; muskeg forest of black spruce and tamarack); Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915); Churchill (several collections, the earliest seen from there being made by Macoun in 1910). First report: Churchill River [Bell, 1880].

(Arctic-)subarctic circumpolar: n. Alaska and n. Mack. to central Keewatin, s. Baffin I., n. Que., north-central Lab., and Nfld., s. to Wash., Alta., n. Minn., and n. Vt.; southern half of Greenland; Iceland; n. Eurasia.

## 2. UTRICULARIA L.

(Bladderwort)

1. Leaf-segments round in cross-section; traps borne on the leaves; stems 0·5 mm. or more thick, free-floating except for a single point of attachment..............1. *U. vulgaris*
1. Leaf-segments flat; stems more slender, creeping on the bottom in shallow water and rooting at the nodes.
   2. Traps borne on the leaves; ultimate leaf-segments entire................2. *U. minor*
   2. Traps borne on separate elongate leafless branches; ultimate leaf-segments minutely toothed..................................................3. *U. intermedia*

1. **U. vulgaris** L. (Incl. var. *americana* Gray; *U. macrorhiza* LeConte)

Ponds and streams almost throughout the province except the extreme north. Northernmost collection: Churchill (Gillett, 1948). Earliest collection seen: "Head of Lake Winnipegosis", marshes (Macoun, 1881). First report: Churchill River [Bell, 1880].

Subarctic circumpolar: n. Alaska and Mack. R. Delta to n. Man., s. Lab., and Nfld., s. to Mex., Tex., Mo., and Va.; Eurasia.

2. **U. minor** L.

Specimens have been seen from the following localities: Whiteshell Forest Reserve, east of Winnipeg, shallow water (Scoggan, 1951); Grand Rapids, near the northwest end of Lake Winnipeg, swampy area (Scoggan, 1948); Cross Lake, northeast of Lake Winnipeg, stagnant pond (Scoggan, 1948); Gillam, about 165 miles south of Churchill (Schofield, 1950); Churchill (Gillett, 1948). First report: near Carberry [Christy, 1887].

Subarctic circumpolar: sw. Alaska and central Yukon to Great Bear L., n. Man., central Lab., and Nfld., s. to Calif., Colo., N.D., and Pa.; sw. Greenland; Iceland; n. Eurasia.

3. **U. intermedia** Hayne

Shallow water almost throughout the province except the northeastern Barren Grounds and the southwestern prairie region. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., marsh (Baldwin, 1951). Earliest collection seen: Porcupine Mountain, marshes and shallow pools (Macoun, 1881). First report: Porcupine Mountain and Lake Winnipeg [Macoun, 1884].

Subarctic circumpolar: n. Alaska and nw. Mack. to s. Keewatin, n. Que., and Nfld., s. to Calif., Ia., and Pa.; sw. Greenland; n. Eurasia.

*U. gibba* L. is listed by Lowe [1943], but without locality. No specimens have been seen, and it should be excluded from our flora.

*U. cornuta* Michx. (*Stomoisia cornuta* (Michx.) Raf.) is cited from Riding Mountain by Lowe [1943], but no specimen has been seen from there, and it should be excluded from our flora.

## 104. PHRYMACEAE

### (Lopseed Family)

### 1. PHRYMA L.

### (Lopseed)

1. **P. leptostachya** L.

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg (Macoun, 1896, damp thickets by brook; Groh, 1922; Marshall, 1941, moist soil in dense shade; Scoggan, 1953, rich woods); Graysville, about 50 miles southwest of Winnipeg, woods (Groh 1932); Carman, about 40 miles southwest of Winnipeg (Strachan, 1938); Portage la Prairie (Denike, 1939, Assiniboine valley). First report: "Damp thickets by a brook at Morden" [J. M. Macoun, 1897].

Temperate eastern American: s. Man. to N.B., s. to e. Tex. and Fla.

## 105. PLANTAGINACEAE

### (Plantain Family)

### 1. PLANTAGO L.

### (Plantain)

1. Leaves linear.
  2. Plant densely grey-villous throughout (drying tawny); spikes very dense.................................1. *P. purshii*
  2. Plant not villous.
    3. Corolla-tube glabrous, its lobes less then 1 mm. long; anthers 2, about 0·5 mm. long, scarcely exserted; posterior sepals sharply keeled; bracts distinctly saccate at base..........2. *P. elongata*
    3. Corolla-tube pubescent externally, its lobes 1-1·5 mm. long; anthers 4, about 1 mm. long, long-exserted; posterior sepals scarcely keeled; bracts not swollen at base..........3. *P. maritima*
1. Leaves lanceolate to ovate.
  4. Rootstock densely covered with a mass of brownish wool among the leaf-bases; spikes remotely flowered except toward tip; seeds 2-4..........4. *P. eriopoda*
  4. Rootstocks naked; spikes more densely flowered.
    5. Bracts and sepals prominently keeled; corolla lobes less than 1 mm. long.
      6. Capsules 2-4 mm. long, dehiscent near the middle, 6-20-seeded; seeds reticulate, 1-1·7 mm. long; sepals obtuse..........5. *P. major*
      6. Capsule 3-6 mm. long, dehiscent near base, 4-9-seeded; seeds smooth, 1·5-2·5 mm. long; sepals acute..........*P. rugelii*
    5. Bracts and sepals scarcely keeled; corolla lobes more than 1 mm. long.
      7. Leaves elliptic to ovate; sepals 4, separate..........6. *P. media*
      7. Leaves lanceolate to lance-oblong; sepals apparently 3, two of them united..........7. *P. lanceolata*

1. **P. purshii** R. & S.

A single specimen has been seen, from Emerson, at the International Boundary south of Winnipeg, where it was collected in sand by W. N. Denike in 1939. First report: "Manitoba" [Groh & Frankton, 1949].

Temperate western American: B.C. to s. Man., s. to Ariz., Tex., and Ill.; adventive farther eastward.

2. **P. elongata** Pursh

Specimens have been seen from the following localities: Melita, about 60 miles southwest of Brandon, alkaline flats of old Souris River channel south of town (Lowe, 1935; Scoggan, 1953, growing with *Allocarya californica*); Miniota, about 50 miles west-northwest of Brandon (Scoggan, 1953, alkaline prairie and alluvial clay of road embankment). First report: Brenda, near the northwest edge of Turtle Mountain [Jackson *et al.*, 1922].

Temperate western American: Alta. to sw. Man., s. to Utah, Tex., and Minn.

3. **P. maritima** L. (*P. oliganthos* R. & S.; *P. juncoides* Lam., incl. var. *decipiens* (Barneoud) Fern. and var. *glauca* (Hornem.) Fern. (*P. borealis* Lange)) [*See* Böcher, 1938, p. 180; Gleason, 1952, p. 271]. Seaside-Plantain. Goose-tongue

Specimens have been seen from the following localities: Dawson Bay, Lake Winnipegosis (Macoun, 1881, salt springs by Red Deer River; Scoggan, 1948, salt marsh, Salt Point; Scoggan, 1950, salt springs by Red Deer River); York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949); Churchill (several collections, the earliest seen being made by Bell in 1884). First report: shore of Hudson Bay between York Factory and Churchill [Bell, 1884].

(Arctic-)subarctic circumpolar: central Alaska and Mack. R. Delta to Great Bear L., n. Man., s. Baffin I., n. Lab., and Nfld., s. along the coast to Calif. and N.J., and alkaline regions of the interior; southern half of Greenland; Iceland; n. Eurasia.

4. **P. eriopoda** Torr.

Damp to wet ground (chiefly alkaline) and shores in the southern two-fifths of the province. Northernmost collection: Norway House, near the northeast end of Lake Winnipeg, bank of Gunisao River at Diamond Rapids (Scoggan, 1948). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, borders of salt marshes (Macoun, 1872). First report: Burman [1910].

Subarctic American: south-central Alaska and nw. Mack. to south central Man. and e. Que., s. to n. Calif., Mex., Neb., and Ia.

5. P. MAJOR L. (Incl. var. *pilgeri* Domin (var. *asiatica* of Am. auth., not *P. asiatica* L.)) Common Plantain. Whiteman's-foot

A common weed of roadsides, waste ground, and shores throughout the province except the extreme north. Northernmost collection: Churchill (Gillett, 1948, cindery ground). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Fort Garry [Schultz, 1861]. Basis of the listing of *P. asiatica* L. by Lowe [1943].

Eurasian: widely naturalized in North America.

6. P. MEDIA L. Hoary Plantain

A single specimen has been seen, from Brandon: (G. Stevenson, 1953, grassland close to roadway, not common). First report: the present publication.

Eurasian: naturalized in North America.

7. P. LANCEOLATA L. Ribgrass

A single specimen has been seen, bearing the data "Manitoba, cultivated fields". First report: Jackson *et al.* [1922]. Cited from Carman and Oak Point by Lowe [1943].

Eurasian: naturalized in North America.

*P. rugelii* Dcne. is listed by Jackson *et al.* [1922] and is cited from Winnipeg by Lowe [1943]. No specimens referable here with certainty have been seen, however, and it should be excluded from our flora for the present.

## 106. RUBIACEAE

### (Madder Family)

1. Leaves opposite; corolla pale purple, funnelform, 5-6 mm. long; stems tufted.................................................................1. *Houstonia*
1. Leaves whorled; corolla white or greenish-white, rarely yellow, rotate, smaller: stems solitary or tufted..........................................................2. *Galium*

### 1. HOUSTONIA L.

### (Houstonia)

1. **H. longifolia** Gaertn.

Dry prairie, rock outcrops, and gravelly clearings of southern Manitoba. Northernmost collection: Churchill (Mrs. E. J. McMillan, 1931; undoubtedly a casual introduction). The northernmost collection in the main Manitoba area was made on Riding Mountain by Halliday in 1932. Earliest collection seen: Sewell (now Camp Hughes), east of Brandon, open sandy prairie (Macoun, 1896). First report: "Abundant about Lake Winnipeg and the Saskatchewan" [Hooker, 1834]. Basis of the citation of *H. ciliolata* Torr. from "Winnipeg and N. W. Angle Road" by Dawson [1875].

Temperate eastern American: Sask. to Ont. and Me., s. to Okla. and Ga.

### 2. GALIUM L.

### (Bedstraw. Cleavers)

1. Ovary and fruit bristly or villous-hirsute.
    2. Principal leaves in 4's, firm, 3-nerved, linear-lanceolate, widest toward base, obtuse or acutish at apex; stem ascending, smooth......................1. *G. septentrionale*
    2. Principal leaves in 6's or 8's, 1-nerved, widest near or above the middle, cuspidate or bristle-tipped; stems weak and reclining or trailing.

3. Stem harsh with recurved bristles, hairy at the joints; leaves mostly 8 in a whorl, bristle-tipped, lanceolate, coarsely ciliate..........................2. *G. aparine*
3. Stem smooth; leaves mostly in 6's, cuspidate, thin, elliptic-lanceolate, minutely ciliate.......................................................3. *G. triflorum*

1. Ovary and fruit smooth.
    4. Flowers yellow; stem smooth, erect; leaves 8 or 6 in a whorl, linear, roughish, often with suppressed axillary branches...................................4. *G. verum*
    4. Flowers white; stems matted, reclining or loosely ascending; leaves mostly in 4's.
        5. Corolla-lobes mostly 4, acute; stems and pedicels essentially smooth.
            6. Leaves in 4's, soon reflexed; flowers relatively few, on ascending pedicels, the cymes soon overtopped by erect lateral branches............5. *G. labradoricum*
            6. Leaves in 2's to 6's, ascending; flowers numerous in terminal cymes, the individual pedicels widely divergent................................6. *G. palustre*
        5. Corolla-lobes mostly 3, obtuse; flowers relatively few, on ascending pedicels; leaves in 4's.
            7. Leaves with backwardly scabrous margins and midrib, linear or linear-oblanceolate; pedicels scabrous....................................7. *G. trifidum*
            7. Leaves of primary axes broadly oblanceolate to oblong-spatulate, they and the pedicels smooth; plant of the Hudson Bay and northern regions...........................................................8. *G. brandegei*

1. **G. septentrionale** R. & S. (*G. boreale* of Am. auth., not L.) [*See* A. & D. Löve, Amer. Midland Nat. 52: 88-105. 1954.] Northern Bedstraw

Thickets, rock outcrops, prairie, shores, and clearings throughout the province, except the extreme north. Northernmost collection: Churchill River at mouth of Little Churchill River (Cairnes, 1915). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Fort Garry, Vivian, Arborg, and Delta [A. & D. Löve, 1954]. Basis of numerous reports of the Eurasian G. *boreale* L. from the province, the earliest by Hooker [1834; "From Lake Winnipeg to the Rocky Mountains..."].

Subarctic American: n. Alaska and Mack. R. Delta to n. Man., James Bay, and e. Que., s. to n. Calif., N.M., Neb., Mo., and Va.; e. Asia. A map of the distribution, together with that of the closely related *G. boreale* L., is given by A. & D. Löve [1954, p. 95, fig. 1].

2. **G. aparine** L. (Incl. var. *vaillantii* Koch) Cleavers

Specimens have been seen from the following localities: near Winnipeg (Batho, 1939); near Teulon, about 25 miles north of Winnipeg (Lange, 1945); The Pas, gardens (Krivda, 1950). First report: Winnipeg [Groh, 1944].

(Subarctic-)temperate circumpolar: sw. Alaska to south-central Man. and Nfld., s. to Calif., Tex., and Fla.

3. **G. triflorum** Michx. Sweet-scented Bedstraw

Woods and thickets in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, border of woods (Scoggan, 1949). Earliest collection seen: Turtle Mountain, woods (Burgess, 1873). First report: Turtle Mountain [Dawson, 1875].

Subarctic circumpolar: north-central Alaska to central Man., central Lab., and Nfld., s. to Calif., Mex., and n. Fla.; sw. Greenland; Eurasia.

4. G. VERUM L. Yellow Bedstraw. Our Lady's Bedstraw

Specimens have been seen from the following localities: Holland, about 35 miles southwest of Portage la Prairie (Batho, 1933); High Bluff, near Portage la Prairie (Struthers, 1931). First report: High Bluff and Altamont [Lowe, 1943]. According to Groh [1944], the species was reported as still present in the Holland area in 1943.

Eurasian: naturalized in North America.

5. **G. labradoricum** Wieg.

Specimens have been seen from the following localities: Vivian, about 25 miles east of Winnipeg, moist ditch (Garton, 1946); Lac du Bonnet, about 50 miles northeast of Winnipeg, spruce and tamarack swamp (Breitung, 1949); Grassy Narrows, Lake Winnipeg, between Hecla Island and the mainland (A. & D. Löve, 1952); Riding Mountain (Rowe, 1948); Grand Rapids, near the northwest end of Lake Winnipeg, black spruce muskeg forest (Scoggan, 1948); Cross Lake, northeast of Lake Winnipeg, black spruce muskeg forest (Scoggan, 1948); Hill Lake, north of Lake Winnipeg, heath bog by Hargrave River (Scoggan, 1948); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, slough inlet and clearing in white spruce forest (Scoggan, 1949); Bear Lake, northwest of Oxford Lake (Moore, 1953); Kettle Rapids of the Nelson River, about 160 miles south of Churchill (Emerton, 1917); York Factory, muskeg forest of black spruce and tamarack (Scoggan, 1949). First report (with citation of localities): the present publication; but accredited to Manitoba in the range given by Fernald [1950].

Subarctic American: central Alta. to s. Keewatin, central Lab., and Nfld., s. to Minn., O., and Pa.

6. **G. palustre** L.

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg (Simpson, 1937; Scoggan, 1951, muskeg forest of black spruce and tamarack); Whiteshell Forest Reserve, east of Winnipeg, muskeg forest of black spruce and tamarack (Scoggan, 1951); Rennie, about 65 miles east of Winnipeg, swampy ground (Scoggan, 1951); Riverton, about 70 miles north of Winnipeg, muskeg forest of black spruce and tamarack, and marshy shore of Lake Winnipeg (Scoggan, 1951); The Pas (Krivda, 1949); Gillam, about 165 miles south of Churchill (Schofield, 1950). First report: the present publication.

Subarctic circumpolar: south-central Yukon and north-central Alta. to Nfld., s. to L. Sup., Wisc., and Pa.; Eurasia.

7. **G. trifidum** L.

Woods, wet ground, and shores throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 43′ N., wet black spruce woods (Baldwin, 1951). Earliest collection seen: "Dawson Road, Manitoba" (Burgess, 1873). First report: "Winnipeg and N.W. Angle Road" [Dawson, 1875]. Probable basis of the citation of *G. claytoni* Michx. (*G. tinctorium* L.) from Spruce Woods Forest Reserve by Shimek [1927].

Subarctic circumpolar: n. Alaska and nw. Mack. to s. Keewatin, s. Lab., and Nfld., s. to Calif., Colo., Neb., O., and N.Y.; Eurasia.

8. **G. brandegei** Gray

A single specimen has been seen, from Churchill, where it was collected by Polunin in 1936. First report: Churchill [Ritchie, 1956].

Subarctic American: se. Alta. to n. Man., n. Que., central Lab., and Nfld., s. to Ariz., N.M., the Great Lakes region, and e. Que.; s. Greenland. A map of the approximate distribution, on which the occurrence of the species at Churchill should be indicated, is given by Löve [Botaniska Notiser, 1950, fig. 19, p. 53].

## 107. CAPRIFOLIACEAE

### (Honeysuckle Family)

1. Leaves pinnately compound; inflorescence a terminal compound cyme; corolla regular, rotate; fruit berry-like, with usually 3 small nutlets........................1. *Sambucus*
1. Leaves simple.
  2. Stems slender and extensively creeping; leaves small, sparingly crenate; flowers mostly paired, drooping from tips of axillary peduncles, the funnelform corolla whitish, striped with rose-purple..................................................2. *Linnaea*
  2. Stems stouter, erect or climbing.
    3. Leaves entire (or in *Symphoricarpos* those of the young shoots often wavy-toothed or lobed); style elongate, with capitate stigma.
      4. Corolla bell-shaped, regular or nearly so; fruit a 2-seeded white berry-like drupe.........................................................3. *Symphoricarpos*
      4. Corolla funnelform to tubular, often gibbous at base, irregularly lobed; fruit a many-seeded berry..........................................4. *Lonicera*
    3. Leaves toothed.
      5. Corolla rotate; inflorescence a terminal compound cyme; style short, 3-lobed; fruit a drupe with a single stone...............................5. *Viburnum*
      5. Corolla funnelform; cymes few-flowered, axillary and terminal; style elongate, with capitate stigma; fruit a slender long-beaked capsule with persistent slender calyx-lobes...............................................6. *Diervilla*

### 1. SAMBUCUS L.

### (Elder)

1. Cymes ovoid, longer than broad; flowers yellow-white, ill-scented; fruits bright red; pith brown..................................................1. *S. pubens*
1. Cymes flat and umbelliform; flowers white, fragrant; fruits purple-black; pith white.............................................................2. *S. canadensis*

1. **S. pubens** Michx. (*S. racemosa* L. subsp. *pubens* (Michx.) Hult.) Redberried Elder. Stinking Elder

Specimens have been seen from the following localities: Winnipeg (Denike, 1939); Seven Sisters Falls, about 50 miles northeast of Winnipeg, rich elm woods (Scoggan, 1951, 1953); Delta, near the south end of Lake

Manitoba, sand dune forest (A. & D. Löve, 1952); Amaranth, about 75 miles northeast of Brandon (unknown collector, 1932); Dauphin, north of Riding Mountain (Fletcher, 1897); Dawson Bay, Lake Winnipegosis, limestone cliffs of Wilkins Point and Nason Island (Scoggan, 1948). First report: Amaranth, Delta, and Waugh [Lowe, 1943]. Basis of reports of the European *S. racemosa* L. from the province.

Subarctic American: south-central Alaska to south-central Man., s. Lab., and Nfld., s. to Oreg., Colo., S.D., and Pa., and upland to Tenn. and Ga.

2. **S. canadensis** L. Common Elder

Specimens have been seen only from Shoal Lake, near the Ontario boundary east of Winnipeg, where the species was collected in 1920 by Lowe and in 1925 by Scott. First report: Burman [1910].

Temperate eastern American: se. Man. to N.S., s. to Okla., La., and Ga.

### 2. LINNAEA Gronov.

(Twinflower)

1. **L. borealis** L. var. **americana** (Forbes) Rehd. (*L. americana* Forbes; subsp. *americana* (Forbes) Hult.)

Conifer woods throughout the province except the northeastern Barren Grounds. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., sandy soil (Baldwin, 1951). Earliest collection seen: "Lake of the Woods, Manitoba" (Dawson, 1873). First report: Warren Landing [Lowe, 1920]. Basis of reports of the main form from the province.

(Arctic-)subarctic American: north-central Alaska and nw. Mack. to central Keewatin, n. Lab., and Nfld., s. to n. Calif., Colo., S.D., and Pa.; Greenland; the Eurasian main form also in Alaska. A map of the northern part of the American distribution of the collective species is given by Raup [1947, pl. XXXV].

### 3. SYMPHORICARPOS Duham.

(Snowberry)

1. Flowers sessile, the clusters many-flowered; lobes of corolla 3-4 mm. long; style 4-8 mm. long, exserted; anthers half as long as the filaments; leaves becoming leathery ........ 1. *S. occidentalis*

1. Flowers short-pedicelled, the clusters usually few-flowered; lobes of corolla 2-3 mm. long; style 2-3 mm. long, included; anthers about equalling to longer than filaments; leaves relatively thin ........ 2. *S. albus*

1. **S. occidentalis** Hook. Wolfberry

Dry prairie, shores, and clearings in the southern half of the province. Northernmost collection: Flin Flon (Gardner, 1930). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Red River [Hooker, 1834].

(Subarctic-)temperate American: sw. Mack. to central Man. and n. shore of L. Sup., s. to N.M., Kans., and Mich.; adventive farther eastward.

2. **S. albus** (L.) Blake (*S. racemosus* Michx., not of most auth.; *S. pauciflorus* (Robbins) Britt.) Snowberry

Rocky woods, rock outcrops, and gravel ridges in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Doghead Point, at the north end of The Narrows, Lake Winnipeg (Macoun, 1884). First report: Doghead, Lake Winnipeg [Macoun, 1886]. Basis of reports of *S. racemosus* from the province.

Temperate American: B.C. to e. Que., s. to Colo., Neb., and w. Va.; in se. Alaska, var. *laevigatus* (Fern.) Blake (*S. rivularis* Suksd.).

## 4. LONICERA L.

## (Honeysuckle)

1. Flowers terminal, in dense clusters or interrupted spikes; leaves whitened beneath, the uppermost ones encircling the twining stem by their united bases.
  2. United involucral leaves green or barely glaucous above, longer than broad, forming a rhombic or elliptic disk; flowers generally purplish (if entirely yellow, more or less pubescent on the outside); whorls of flowers and fruits crowded; leaves usually of an oblong type....................................1. *L. dioica* var. *glaucescens*
  2. United involucral leaves glaucous above, broader than long, forming a suborbicular disk; flowers pale yellow, glabrous without; whorls of flowers and fruits usually separated; leaves more of an oval type..............................*L. prolifera*
1. Flowers in pairs on axillary peduncles; leaves petioled; stems not twining.
  3. Flowers subtended by 4 green to dark purple leaf-like bracts; berries purple-black; plant chiefly of the low-northern regions.........................2. *L. involucrata*
  3. Flowers subtended by 2 linear bracts; berries red or blue.
    4. Leaves glabrous, cordate-oval; branchlets with hollow centre; berries red.................................................................3. *L. tatarica*
    4. Leaves pubescent beneath, tapering to rounded at base; branchlets filled with pith.
      5. Peduncles mostly longer than the flowers; corolla more or less hairy without; berries orange-yellow to deep red; leaves not ciliate, mostly widest below the middle..............................................4. *L. oblongifolia*
      5. Peduncles shorter than to about equalling the flowers; corolla glabrous on the outside; berries blue; leaves ciliate, mostly widest above the middle.....................................................5. *L. villosa* var. *solonis*

1. **L. dioica** L. var. **glaucescens** (Rydb.) Butters (*L. glaucescens* Rydb.)

Woods, thickets, and rock outcrops in the southern two-thirds of the province. Northernmost collection: Hayes River at The Rock, about 100 miles southwest of York Factory, white spruce woods (Scoggan, 1949). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, in thickets (Macoun, 1879). First report: various localities [J. M. Macoun, 1897]. Basis of reports of the main form and of *L. parviflora* Lam. and *L. hirsuta* Eat. from the province.

Temperate American: B.C. to w. Que., s. to Okla., Ky., and N.C.

*L. prolifera* (Kirchn.) Rehd. (*L. sullivantii* Gray), Grape-Honeysuckle, is cited from Fort Ellice, Manitoba House, and near Emerson by Macoun [1884]. The Emerson specimen has not been seen, but the Manitoba House and Fort Ellice specimens are referred to *L. glaucescens* by J. M. Macoun [1897]. The species should be excluded from our flora for the present.

2. **L. involucrata** (Richards.) Banks (*Distegia involucrata* (Richards.) Cockerell)

Specimens have been seen from the following localities: Riding Mountain, white spruce woods (Scoggan & Baldwin, 1950); Hill Lake, north of Lake Winnipeg, limestone ledges at entrance of Minago River (Scoggan, 1948); Hayes River at Robinson Portage (Scoggan, 1949); Wabowden, about 135 miles northwest of The Pas (Brooks, 1940); Oxford Lake, white spruce woods (Scoggan, 1949); Hayes River at The Rock, about 100 miles southwest of York Factory (Scoggan, 1949); Gillam, about 165 miles south of Churchill (Schofield, 1950). First report: Churchill River [Bell, 1880].

(Subarctic-)temperate American: s. Alaska and n. B.C. to north-central Man., s. James Bay, and e. Que., s. to Calif., N.M., Mex., Wisc., Mich., and N.B. A map of the northern part of the distribution is given by Raymond [1950, fig. 19, p. 34].

3. L. TATARICA L. Tartarian Honeysuckle

Specimens have been seen from the following localities: Virden, about 45 miles west of Brandon, thicket (Scoggan, 1951); The Pas (Krivda, 1952). First report: Brandon [Groh & Frankton, 1948].

Eurasian: escaped from cultivation in North America.

4. **L. oblongifolia** (Goldie) Hook. (*Xylosteon oblongifolium* Goldie) Swamp-Fly-Honeysuckle

Thickets and woods, usually swampy, in the southern quarter of the province; the citation from Flin Flon by Lowe [1943] requires verification. Northernmost collection seen: Gypsumville, about 125 miles north of Portage la Prairie, dry jack-pine woods (Scoggan, 1951). Earliest collection seen: "Dawson Road, Manitoba" (Dawson, 1873). First report: "Lake Winipeg" [Hooker, 1834]. Probable basis of the citation of *L. canadensis* Bartr. (*Xylosteon canadense* (Marsh.) Duham.; *L. ciliata* Muhl.) from Riding Mountain by Halliday [1932] and Lowe [1943].

Temperate eastern American: e. Sask. to se. Que., s. to Minn. and Pa.

5. **L. villosa** (Michx.) R. & S. var. **solonis** (Eat.) Fern. Mountain-Fly-Honeysuckle

Wet woods, swampy ground, and bogs in the southern two-thirds of the province, except the southwestern prairie region. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: "Winipeg Valley" (Bourgeau, 1857). First report: Winnipeg Valley [Fernald, Rhodora 27: 7. 1925]. Basis of citations of the main form and of *L. caerulea* L. (*Xylosteon caeruleum* (L.) Dum.-Cours and its var. *villosa* T. & G. from the province.

Subarctic eastern American: north-central Man. to n. Que. and Nfld., s. to Minn. and N.E.

## 5. VIBURNUM L.

1. Leaves palmately 3-5-nerved from base, mostly lobed; fruits red or orange.
   2. Marginal flowers of the cyme greatly enlarged and showy; leaves 3-lobed, the lobes long-acuminate........1. *V. trilobum*
   2. Marginal flowers not enlarged; leaves 3-5-lobed........2. *V. edule*
1. Leaves pinnately veined, unlobed; fruits dark purple.
   3. Leaves finely and sharply toothed, their veins curving, their petioles undulate-margined........3. *V. lentago*
   3. Leaves coarsely toothed, rounded to subcordate at base, their veins straightish........4. *V. rafinesquianum*

1. **V. trilobum** Marsh. (*V. opulus* L. var. *americanum* Ait.) Highbush-Cranberry

Woods, thickets, and shores in the southern half of the province. Northernmost collection: Hill Lake, north of Lake Winnipeg, limestone ledges at entrance of Minago River (Scoggan, 1948). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Spruce Woods Forest Reserve [Bird, 1927]. Basis of reports of the Eurasian *V. opulus* L. from the province.

(Subarctic-)temperate American: B.C. to Nfld., s. to Wash., Wyo., n. Ill., and Pa.

2. **V. edule** (Michx.) Raf. (*V. pauciflorum* La Pylaie; *V. eradiatum* (Oakes) House) Mooseberry. Pimbina

Woods, thickets, shores, and gravel ridges throughout the province except the northeastern Barren Grounds and the southwestern prairie region. Northernmost collection: Nueltin Lake, lat. 59° 48′ N., sandy esker (Baldwin, 1951). Earliest collection seen: Old Norway House, near the northeast end of Lake Winnipeg (Anderson, 1851). First report: Nelson River [Bell, 1880].

(Arctic-)subarctic American: n. Alaska and nw. Mack. to s. Keewatin, n. Que., and Nfld., s. to Oreg., Colo., n. Minn., and Pa.; ne. Asia. A map of the northern part of the American distribution is given by Raup [1947, pl. XXXIV].

3. **V. lentago** L. Sheepberry. Nannyberry

Thickets and borders of woods in the southern quarter of the province. Northernmost collection: Duck Mountain, edge of woods (Scoggan & Baldwin, 1950). Earliest collection seen: Fort Garry (Schultz, 1861). First report: "Winipeg" [Bourgeau, in Palliser, 1863]; probable basis of the listing of *V. cassinoides* L. (cymes peduncled rather than sessile) by Jackson *et al.* [1922] and Lowe [1943].

Temperate American: s. Man. to w. Que., s. to Wyo., Colo., S.D., n. Mo., and Ga.

4. **V. rafinesquianum** Schultes (*V. pubescens* of auth., not (Ait.) Pursh; *V. affine* Bush var. *hypomalacum* Blake) Downy Arrow-wood

Thickets, woods, and rocky ground of southern Manitoba. Northernmost collection: Duck Mountain, rocky ravine (MacMillan, 1906). Earliest collection seen: "Winipeg Valley" (Bourgeau, 1859). First report: Manitoba [Blake, Rhodora 20: 14. 1918].

Temperate eastern American: s. Man. to sw. Que., s. to Mo., Ky., and Ga.

### 6. DIERVILLA Duham.

(Bush-Honeysuckle)

1. **D. lonicera** Mill. (*D. diervilla* (L.) MacM.)

Dry woods and rock outcrops in the southern half of the province. Northernmost collection: The Pas (Krivda, 1951). Earliest collection seen: Observation Point, east coast of Lake Winnipeg opposite Hecla Island (Macoun, 1884). First report: "Winnipeg and N. W. Angle Road" [Dawson, 1875; as *D. trifida* Moench].

(Subarctic-)temperate eastern American: s. Man. to Nfld., s. to Ia., O., and N.C.

## 108. ADOXACEAE

(Moschatel Family)

### 1. ADOXA L.

1. **A. moschatellina** L. Moschatel

A single specimen has been seen, from Duck Mountain, where it was collected in a damp white spruce woods by Scoggan & Baldwin in 1950. First report: "Lat. 54-64" [Jackson *et al.*, 1922]. Reported from north of Berens River by Lowe [1943].

Subarctic circumpolar (with large gaps); central Alaska and central Yukon to s. Man., s. to Utah, N.M., Ia., Wisc., and N.Y.

## 109. VALERIANACEAE

(Valerian Family)

### 1. VALERIANA L.

(Valerian)

1. Leaves nearly parallel-veined, densely ciliate; flowers yellowish-white; fruit ovate-oblong........*V. ciliata*
1. Leaves pinnate-veined, not densely ciliate; fruit lance-oblong.
    2. Basal leaves simple or merely with 1-3 small basal lobes; principal stem-leaves with 2-6 pairs of lateral leaflets and a larger terminal one; flowers white or pinkish........1. *V. septentrionalis*
    2. Basal leaves all pinnate, the pinnae nearly equal; principal stem-leaves with 5-12 pairs of leaflets; flowers roseate........*V. officinalis*

1. **V. septentrionalis** Rydb. (*V. sylvatica* Banks, not Schmidt; *V. dioica* L. subsp. *sylvatica* (Sol.) Mey.)

Specimens have been seen from the following localities: Teulon, about 30 miles north of Winnipeg (Popowick, 1918; Hunter, 1927; Peterson, 1928); Brandon (Hales, 1918); Riding Mountain (Halliday, 1932; Rowe, 1948, wet meadow; Scoggan & Baldwin, 1950, bog); Duck Mountain, light white spruce woods (Scoggan & Baldwin, 1950); Gillam, about 165 miles south of Churchill, shade by Kettle River (Schofield, 1950); York Factory (McTavish, 1851; Scoggan, 1949, white spruce woods). First report: Riding Mountain [Lowe, 1943].

Subarctic American: central Yukon to north-central Man., n. Que., and Nfld., s. to Calif., Nev., S.D., s. Ont., and s. N.B. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXXV].

*V. ciliata* T. & G. (*V. edulis* Nutt. ssp. *ciliata* (T. & G.) Mey.) is listed by Jackson *et al.* [1922], and cited from Swan River by Lowe [1943]. No specimens have been seen, however, nor are Manitoba stations shown on the map of Meyer [Ann. Mo. Bot. Gard. 38: 425 (fig. 18). 1951]. It should be excluded from our flora for the present.

*V. officinalis* L., "Garden-Heliotrope", is cited from Riding Mountain and Ochre River by Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora for the present.

## 110. DIPSACACEAE

### (Teasel Family)

### 1. KNAUTIA L.

1. K. ARVENSIS (L.) Duby (*Scabiosa arvensis* L.) Bluebuttons

Specimens have been seen from the following localities: Hazelridge, about 15 miles east of Winnipeg (Rook, 1936; Wood, 1942); Winnipeg (Fowler, 1939); near Bethany, about 35 miles north of Brandon (Strachan, 1941). First report: near Headingly, west of Winnipeg [Lowe, 1943].

European: naturalized in eastern North America.

## 111. CUCURBITACEAE

### (Gourd Family)

1. Leaves cordate-ovate, unlobed, harshly scabrous; flowers yellow and showy, 1·5-2·5 cm. long, solitary on axillary peduncles; fruit many-seeded, not prickly......1. *Thladiantha*
1. Leaves deeply and sharply 5-lobed; flowers small, greenish-white, the staminate very numerous in narrow compound racemes, the pistillate solitary or few from the same axils; fruit usually 4-seeded, armed with slender spines.................2. *Echinocystis*

### 1. THLADIANTHA Bunge

1. T. DUBIA Bunge

A single specimen has been seen, from Brandon, where it was collected on the grounds of the Experimental Farm by E. Brown in 1935. First report: Brandon [Groh & Frankton, 1948].

Asiatic: spread from cultivation in eastern North America.

### 2. ECHINOCYSTIS T. & G.

1. **E. lobata** (Michx.) T. & G. (*Micrampelis lobata* (Michx.) Greene) Wild or Prickly Cucumber

Climbing on fences and in thickets, chiefly as a garden escape, in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: "Plains of the Red and Assinaboyne Rivers..." [Hooker, 1834; *Sicyos lobata* Michx., under synonymy of *Momordica ?echinata*].

Temperate eastern American: Sask. to N.B., s. to Tex. and Fla.

## 112. CAMPANULACEAE

(Bluebell Family)

1. Corolla regular; anthers separate....................................1. *Campanula*
1. Corolla irregular, 2-lipped; anthers united into a tube......................2. *Lobelia*

### 1. CAMPANULA L.

(Bellflower)

1. Flowers short-pedicelled in an elongate terminal raceme; leaves irregularly toothed, the lower ones cordate-ovate, the upper ovate-lanceolate...............1. *C. rapunculoides*
1. Flowers solitary at the tip of the main axis, or slender-peduncled in a loose few-flowered panicle.
    2. Stem and leaves smooth.
        3. Flower solitary, the corolla 5-10 mm. long; capsule erect; plant of the Hudson Bay region.......................................................2. *C. uniflora*
        3. Flowers 1-many, the corolla about 2 cm. long; capsule nodding...3. *C. rotundifolia*
    2. Stem scabrous on the angles with downward-pointing bristly hairs; leaves scabrous on margins and midrib.
        4. Corolla whitish, 5-8 mm. long; calyx 1·3-3·8 mm. long, its lobes 0·7-2 mm. long.............................................4. *C. aparinoides*
        4. Corolla bluish, 10-12 mm. long; calyx 3-6·7 mm. long, its lobes 2-4 mm. long.............................................5. *C. uliginosa*

1. C. RAPUNCULOIDES L.

Specimens have been seen from the following localities: St. James, Winnipeg (unknown collector, 1949); Brandon (Stevenson, 1953; "Shady banks, wasteland. Forming large dense colonies. A rather common escape and some patches apparently established a long time"). First report: the present publication.

Eurasian: naturalized in eastern North America.

2. **C. uniflora** L.

Specimens have been seen only from Churchill (Simpson, 1942; Beckett, 1953). First report: between York Factory and Churchill [Rae, 1850].

Arctic circumpolar (with large gaps): n. coast of Alaska and Mack., Can. Arct. Arch. (to central Ellesmereland), n. Que., and n. Lab., s. to

Utah, Colo., n. Man., James Bay, and e. Que.; Greenland; Iceland; n. Eurasia. A map of the distribution, on which the occurrence of the species at Churchill should be indicated, is given by Fernald [1929, map 20, p. 1498].

3. **C. rotundifolia** L. (Incl. the intergrading var. *intercedens* (Witasek) Farw. and var. *petiolata* (A. DC.) Henry (*C. petiolata* A. DC.)) Harebell. Bluebell

Prairie, sandhills, rock outcrops, and clearings in the southern three-fifths of the province. Northernmost collection: Nelson River at Limestone Rapids, about 155 miles south of Churchill, railway clearing (Scoggan, 1949). Earliest collection seen: Assiniboine River (Schultz, 1861). First report: Red River prairie [Dawson, 1875]. Basis of the citation of *C. scheuchzeri* from near Carberry by Christy [1887], and its accrediting to Manitoba by Macoun [1884].

Arctic circumpolar: Seward Pen., Alaska, to Great Bear L., n. Man., central Baffin I., n. Que., n. Lab., and Nfld., s. to Calif., Mex., Neb., and Pa.; southern half of Greenland; Iceland; n. Eurasia.

4. **C. aparinoides** Pursh Marsh-Bluebell

Swampy ground and shores in the southern half of the province. Northernmost collection: Hayes River near Swampy Lake, white spruce woods (Scoggan, 1949). Earliest collection seen: Muskeg Island, Lake Winnipeg, in bogs (Macoun, 1884). First report: "Winipeg" [Bourgeau, in Palliser, 1863].

Temperate eastern American: central Man. to N.S., s. to Colo., Ia., and Ga.

5. **C. uliginosa** Rydb. (*C. aparinoides* var. *uliginosa* (Rydb.) Gl.) Marsh-Bluebell

Swampy ground in the southern half of the province. Northernmost collection seen: Herb Lake village on Wekusko Lake, about 90 miles north-east of The Pas, slough (Scoggan, 1949); reported from Churchill by Ritchie [1956]. Earliest collection seen: Winnipeg, thickets (Macoun, 1896). First report: Pine Ridge and Moosehorn [Lowe, 1943].

Temperate eastern American: central Man. to James Bay and N.B., s. to Neb. and Pa.; reported from Sask.

## 2. LOBELIA L.

## (Lobelia)

1. Plants terrestrial, leafy-stemmed.
  2. Flowers about 2·5 cm. long, in a dense terminal raceme; corolla-tube with lateral openings; leaves lanceolate, glabrous................1. *L. siphilitica* var. *ludoviciana*
  2. Flowers 7-16 mm. long; corolla-tube without lateral openings.
    3. Flowers on slender lax pedicels in a loose raceme; lower lip of corolla smooth at base; stem-leaves linear to narrowly lanceolate..........................2. *L. kalmii*
    3. Flowers short-pedicelled in a slender, dense, spike-like raceme; lower lip of corolla densely hairy at base; stem-leaves lanceolate or oblanceolate.

4. Anther-tubes bluish-grey.
    5. Plant essentially glabrous except at base........................*L. spicata*
    5. Plant bristly-pubescent nearly throughout...........3. *L. spicata* var. *hirtella*
4. Anther-tubes white; plant essentially glabrous except at base..................
..........................................3a. *L. spicata* var. *campanulata*
1. Plant aquatic, scapose, with a basal rosette of linear, fleshy, hollow leaves...*L. dortmanna*

1. **L. siphilitica** L. var. **ludoviciana** A. DC. Great Lobelia

Represented in the herbarium of the Department of Botany, University of Toronto, by a specimen from near Turtle Mountain, where it was collected on "low open prairie" by T. W. Burgess in 1874. First report: Turtle Mountain [McVaugh, 1936, p. 283].

Temperate eastern American: s. Man. to Wisc., s. to Tex. and La. A map of the distribution is given by McVaugh [1936, fig. 6, p. 283].

2. **L. kalmii** L. (*L. strictiflora* (Rydb.) Lunell)

Moist to wet ground in the southern three-quarters of the province. Northernmost collection: York Factory (McTavish, undated, but probably 1853–54). Earliest collection seen: the foregoing York Factory specimen; the earliest dated specimen seen is one collected on Elk Island, near the south end of Lake Winnipeg, by Macoun in 1884. First report: "Height of land muskeg between Lake of Woods and Red River" [Dawson, 1875].

Subarctic American: south-central Mack. to north-central Man. and Nfld., s. to Colo., S.D., and Pa. A map of the distribution (incomplete in the north) is given by McVaugh [1936, fig. 29, p. 357].

3. **L. spicata** Lam. var. **hirtella** Gray Pale-spike-Lobelia

Damp to dry prairie and clearings of southern Manitoba. Northernmost collection: Eriksdale, about 60 miles north of Portage la Prairie, grassland (Scoggan, 1951). Earliest collection seen: Turtle Mountain (Burgess, 1874). First report: Turtle Mountain, low open prairie [Dawson, 1875]. Basis of reports of the main form from the province, and the listing of *L. inflata* L. by Lowe [1943]. A small part of the Manitoba material approaches the typical form in its reduced pubescence.

Temperate American: Alta. to e. Que., s. to Kans., Mo., and L.I. A map of the distribution is given by McVaugh [1936, fig. 16, p. 314].

3a. **L. spicata** var. **campanulata** McVaugh

A specimen appearing referable here has been seen from Brandon, where it was collected on moist prairie by H. Marshall in 1949. First report: the present publication.

Temperate eastern American: s. Man. to Minn. and s. Me., s. to Ill. and Del. A map of the distribution, on which the occurrence of the variety in Manitoba should be indicated, is given by McVaugh [1936, fig. 17, p. 317].

*L. dortmanna* L., Water-Lobelia, is listed by Burman [1910], Jackson *et al.* [1922], and Lowe [1943], without citation of locality. No specimens have been seen, and it should be excluded from our flora for the present.

## 113. COMPOSITAE

### (Composite Family)

1. Heads composed of central tubular disk-flowers (fertile) and marginal ligulate ray-flowers (sterile), or of disk-flowers only; juice not milky.
2. Heads rayless (or apparently so), the flowers usually all tubular.
3. Leaves, and usually the phyllaries, prickly.
Pappus-bristles plumose to the middle..............................41. *Cirsium*
Pappus-bristles not plumose....................................42. *Carduus*
3. Leaves not prickly.
4. Mature fruiting heads deciduous as a "bur" covered with hooked spines or bristles.
5. Flowers numerous in the heads, all perfect; pappus of many short rough bristles.............................................40. *Arctium*
5. Flowers monoecious, the fertile ones only 2 together in the closed and woody burs, the sterile heads in short spikes above them; pappus none.......................................................................18. *Xanthium*
4. Mature heads not forming burs.
6. Leaves with distinct leaflets or finely dissected or deeply cleft.
7. Heads of two kinds, the 1-seeded fruiting ones borne at the bases of slender racemes of staminate heads..............................17. *Ambrosia*
7. Heads all alike.
8. Achenes 2-awned at summit, the awns downwardly barbed; leaves mostly of distinct leaflets........................................25. *Bidens*
8. Achenes awnless, the pappus none or merely a short crown; leaves finely dissected or deeply cleft.
9. Receptacle conical; heads solitary at the ends of the branches; pappus obsolete; odour of bruised plant suggesting pineapple..........................................................33. *Matricaria*
9. Receptacle flat or merely low-convex.
10. Heads corymbose, 0·5-2 cm. broad; receptacle convex; pappus a short crown....................................35. *Tanacetum*
10. Heads in spike-like, racemose, or paniculate inflorescences, smaller; receptacle flat; pappus none......................36. *Artemisia*
6. Leaves entire or merely toothed or broadly lobed.
11. Phyllaries, at least the inner ones, toothed, strongly fringed or tipped by stout yellow spines......................................43. *Centaurea*
11. Phyllaries mostly entire, ciliate or eciliate (erose or toothed in *Liatris ligulistylis* with stem from a roundish corm).
12. Pappus none.
13. Receptacle naked or beset with long woolly hairs; phyllaries scarious or papery; leaves alternate; plants mostly strong-scented.....................................................36. *Artemisia*
13. Receptacle chaffy; phyllaries herbaceous or membranaceous, not scarious; leaves opposite or the upper alternate............16. *Iva*
12. Pappus of capillary bristles, either barbellate or plumose.
14. Leaves opposite or whorled; inflorescence a flattish-topped corymb of whitish or purple flowers.......................2. *Eupatorium*
14. Leaves alternate.
15. Phyllaries thin and papery.
16. Basal leaves mostly spreading and forming depressed rosettes, differing in outline from the more or less reduced stem-leaves; pappus of pistillate flowers united at base in a ring; plants dioecious.....................13. *Antennaria*
16. Basal leaves similar to the stem-leaves and usually not forming rosettes; pappus-bristles distinct, not united at base.

17. Phyllaries pearly-white, in several distinct series; heads corymbose; stem erect, 1-9 dm. high......14. *Anaphalis*

17. Phyllaries brownish, only slightly imbricated; heads small, in terminal woolly clusters; stem often diffusely branched............................15. *Gnaphalium*

15. Phyllaries not thin and papery.

18. Phyllaries narrowly ovate to suborbicular, in several distinct series; pappus purplish and barbellate or whitish and plumose; leaves punctate.

19. Involucres mostly 1 cm. or more high; heads in a simple raceme or leafy-bracted spike; leaves linear to narrowly lanceolate, entire........................3. *Liatris*

19. Involucres 5-9 mm. high; heads cymose-paniculate; leaves lanceolate to lance-ovate, sharply toothed..................................................1. *Vernonia*

18. Phyllaries slenderly linear to lance-attenuate, in only 1 or 2 distinct series; heads mostly loosely disposed, sometimes solitary; leaves not punctate.

20. Leaves undulate to pinnate-lobed; bractlets often present at base of involucre.................39. *Senecio*

20. Leaves entire or remotely and shallowly toothed; basal bractlets wanting.

21. Phyllaries glabrous or the outer ones merely ciliate at base, non-glandular; heads on mostly leafy branchlets (*A. brachyactis*)........................10. *Aster*

21. Phyllaries sparingly to copiously hispid, or, if glabrate, either the phyllaries glandular-powdery and viscid or the leaves with margins strongly bristly-ciliate; heads on naked peduncles..............12. *Erigeron*

2. Heads with marginal ligulate ray-flowers.

22. Ligules yellow (sometimes purplish toward base).

23. Involucre heavily glutinous, the phyllaries with strongly recurving tips; pappus of 2-8 deciduous awns......................................4. *Grindelia*

23. Involucre not glutinous; phyllaries not strongly recurving at tip.

24. Plant aquatic; submersed leaves repeatedly divided into numerous capillary segments, the upper emersed leaves entire to pectinate; pappus of 3-6 long rigid persistent awns...............................26. *Megalodonta*

24. Plants terrestrial; leaves not dimorphic.

25. Pappus of (2-)4 downwardly barbed awns; leaves simple, lanceolate to oblong-lanceolate, opposite, coarsely and sharply serrate, mostly sessile and commonly somewhat clasping at base (*B. cernua*)..........................................................25. *Bidens*

25. Pappus of bristles or scales, or wanting.

26. Pappus of capillary bristles; receptacle naked.

27. Phyllaries herbaceous, of nearly equal length.

28. Stem-leaves opposite; pappus-bristles rigid.......38. *Arnica*

28. Stem-leaves alternate; pappus-bristles soft.......39. *Senecio*

27. Phyllaries, at least toward apex, thin and scarious, in several distinct series.

29. Phyllaries bristle-tipped; involucre about 1 cm. broad; leaves pinnately or bipinnately parted, more or less white-tomentose, the lobes and teeth bristle-tipped...............................................8. *Haplopappus*

29. Phyllaries not bristle-tipped; leaves entire or shallowly toothed.

30. Heads large, solitary or corymbose; pappus double; stems cespitose from a heavy crown, mostly arched-ascending; plants of dry prairie habitats.....6. *Chrysopsis*

30. Heads small and numerous; pappus single; stems mostly solitary and erect........................7. *Solidago*

26. Pappus of chaffy scales, a mere crown-like border, or wanting.
    31. Leaves all or mostly opposite.
        32. Leaves, at least the lower and basal ones, pinnately divided into linear or narrowly lanceolate segments; ligules purplish-brown at base; heads numerous, corymbose, on slender stalks....................................24. *Coreopsis*
        32. Leaves undivided; ligules yellow throughout; heads larger and fewer.
            33. Ligules firm, persistent at the summit of the marginal achenes after withering..................19. *Heliopsis*
            33. Ligules petaloid and promptly deciduous..23. *Helianthus*
    31. Leaves all or mostly alternate.
        34. Leaves pinnately divided.
            35. Phyllaries dry and scarious, in several distinct series; receptacle nearly hemispheric; leaves finely dissected, whitish-pubescent (*A. tinctoria*)............32. *Anthemis*
            35. Phyllaries green and herbaceous, in only 1 or 2 series; receptacle conical or columnar; leaves green.
                36. Flowering receptacle columnar; achenes flattened and sharp-edged; leaflets 5-9, narrowly linear to oblong, entire or 2-3-cleft...............22. *Ratibida*
                36. Flowering receptacle conical, becoming columnar only in fruit; achenes 4-sided; leaves 3-7-cleft, the often broad divisions variously toothed or lobed (*R. laciniata*)........................20. *Rudbeckia*
        34. Leaves entire or merely toothed or lobed.
            37. Leaves narrowly linear, entire, less than 4 mm. wide.
                38. Plant toward summit beset with long gland-tipped hairs; receptacle chaffy; phyllaries uniseriate, the outer ones laterally compressed and enclosing the laterally compressed achene; stem solitary, annual.........................................28. *Madia*
                38. Plant glabrous and non-glandular (but often glutinous toward summit); receptacle naked; phyllaries in several distinct series, not laterally compressed; stems numerous from a woody base..................................................5. *Gutierrezia*
            37. Leaves, or all except the uppermost, narrowly lanceolate to broadly ovate, more than 4 mm. wide.
                39. Receptacle chaffy.
                    40. Receptacle conical; disk-flowers dark purple; achenes 4-sided; pappus a mere crown-like border..........................20. *Rudbeckia*
                    40. Receptacle flat or low-convex; disk-flowers yellow throughout or with summits brown to dark purple; achenes laterally compressed; pappus of 2 or 4 thin chaffy deciduous scales...............................................23. *Helianthus*
                39. Receptacle not chaffy.
                    41. Ligules and disk-flowers yellow throughout; receptacle naked; pappus of 5-8 thin scales shorter than the achenes; leaves entire to shallowly toothed........................29. *Helenium*
                    41. Ligules purplish or reddish at base; disk-flowers purple-tipped; receptacle bristly; pappus of 5-10 thin awn-tipped scales longer than the achenes; lower leaves more or less deeply lobed.........................................30. *Gaillardia*

22. Ligules purple, blue, pink, or white (yellowish in *Aster lutescens* with firm phyllaries and corymbose heads).
    42. Plant stemless or nearly so, from a deep woody root, tufted, the heads closely sessile; ligules white or purplish; leaves narrowly linear to slightly spatulate ........................................................11. *Townsendia*
    42. Plants with leafy stems.
        43. Leaves deeply pinnatifid to finely 2-3-divided; ligules white.
            44. Receptacle chaffy, at least toward summit or centre.
                45. Heads small and numerous in close corymbs; ligules 1-4 mm. long; receptacle flattish..................................31. *Achillea*
                45. Heads larger, solitary at the tips of the branches and branchlets; ligules 6-10 mm. long; receptacle conical.............32. *Anthemis*
            44. Receptacle naked.
                46. Leaves bipinnatifid; receptacle hemispherical or conical.............................................................33. *Matricaria*
                46. Leaves once-pinnatifid; receptacle flat or low-convex.............................................................34. *Chrysanthemum*
        43. Leaves entire or merely toothed or irregularly lobed.
            47. Plants scapose, the broad leaves all from the rhizome, the flowering-stem merely with sheathing scaly bracts preceding the leaves.............................................................37. *Petasites*
            47. Plants with leafy stems.
                48. Leaves opposite, ovate, coarsely toothed, petioled; heads small, the involucre only 2-3 mm. high, the white roundish ligules 1-2 mm. long ..............................................27. *Galinsoga*
                48. Leaves alternate; heads larger.
                    49. Receptacle densely covered with spiny-tipped chaff exceeding the disk-flowers; rays purplish or sometimes white; leaves lanceolate, 3-nerved, entire; plant hirsute with tuberculate-based hairs..................................21. *Echinacea*
                    49. Receptacle naked.
                        50. Receptacle globose to conical, less than 2 mm. high and broad; pappus of several short bristles and 2 longer awn-like ones; ligules white or lilac, 1-1·8 cm. long; leaves linear to lanceolate, firm, entire.............................9. *Boltonia*
                        50. Receptacle flat or low-convex.
                            51. Pappus none; ligules white; leaves shallowly toothed to pinnatifid or coarsely lobed..........34. *Chrysanthemum*
                            51. Pappus of capillary bristles; leaves entire or toothed to shallowly lobed.
                                52. Heads on mostly leafy branchlets; phyllaries in several distinct series.....................10. *Aster*
                                52. Heads on naked peduncles; phyllaries uniseriate.........................................12. *Erigeron*

1. Heads composed wholly of perfect flowers with ligulate corollas; juice usually milky.
    53. Pappus none; flowers yellow; involucre uniseriate but with a series of small bractlets at base; principal leaves ovate, coarsely toothed, sometimes lyrate......44. *Lapsana*
    53. Pappus present, of scales or capillary bristles.
        54. Pappus of chaffy scales or of both chaff and bristles; leaves clasping at base.
            55. Flowers bright blue, the sessile heads mostly 2 or 3 together in the leaf-axils; pappus of uniform chaffy scales; stem abundantly leafy, the lower leaves often runcinate.........................................45. *Cichorium*
            55. Flowers yellow, the heads borne at the tips of branches of the forking stem; pappus double, the inner delicate bristles subtended by an outer series of thin chaffy scales; stem-leaves only 1-3, entire; radical leaves wing-petioled, often toothed, sometimes pinnatifid..........................46. *Krigia*
        54. Pappus entirely of bristles.

56. Pappus-bristles plumose; flowers yellow; leaves grass-like, clasping .......................................................47. *Tragopogon*
56. Pappus-bristles not plumose.
  57. Plants scapose, the leaves mostly in a basal rosette.
    58. Flowers orange-red; heads corymbose at top of scape; plant long-hirsute, with rooting stolons (*H. aurantiacum*).........55. *Hieracium*
    58. Flowers yellow; plants non-stoloniferous.
      59. Achenes muricate (rough with short hard points) near apex, 4-5-ribbed, slender-beaked; heads solitary; leaves runcinate..........................................48. *Taraxacum*
      59. Achenes not muricate, 10-ribbed, beakless or short-beaked.
        60. Head solitary at top of the naked scape; involucres mostly 1·5-2 cm. high; leaves linear to narrowly lanceolate, entire or coarsely toothed or lobed.......................52. *Agoseris*
        60. Heads mostly corymbose on the bracted scape; involucres about 1 cm. high; leaves narrowly to broadly lanceolate, subentire to coarsely and distantly toothed..........53. *Crepis*
  57. Plants with leafy stems.
    61. Flowers yellow.
      62. Achenes flat or flattish.
        63. Achenes beakless; flowers 50 or more in each head.....................................................49. *Sonchus*
        63. Achenes with a distinct soft filiform beak; heads 5-20-flowered ...........................................50. *Lactuca*
      62. Achenes columnar or nearly so, beakless.
        64. Involucre copiously glandular-pilose; upper and median stem-leaves linear, revolute-margined, mostly entire (*C. tectorum*)......................................53. *Crepis*
        64. Involucre glandless or merely with a few glandular hairs; leaves lanceolate to narrowly ovate (if linear and revolute-margined, the involucre glandless)............55. *Hieracium*
    61. Flowers whitish, pink, rose-purple, or blue; achenes mostly beakless or with short firm beak.
      65. Achenes flattish; flowers blue......................50. *Lactuca*
      65. Achenes columnar.
        66. Flowers rose-purple; heads solitary at the ends of branches; leaves linear, entire, less than 5 mm. wide......51. *Lygodesmia*
        66. Flowers whitish or pink; heads in compact or open panicles; leaves broad, entire to deeply lobed...........54. *Prenanthes*

## 1. VERNONIA Schreb.

(Ironweed)

1. **V. fasciculata** Michx. var. **corymbosa** (Schwein.) Schub. (*V. corymbosa* Schwein.)

Specimens have been seen only from Morris, about 35 miles south of Winnipeg: (Macoun, 1896, by river; Scoggan, 1953, a single large clump in a grassy ditch). First report: Jackson *et al.* [1922].

Temperate (interior) American: s. Man. and Minn., s. to Kans.

## 2. EUPATORIUM L.

1. Leaves opposite, lanceolate, the often broadened bases united around the stem; flowers whitish...........................................................1. *E. perfoliatum*
1. Leaves whorled, densely short-pubescent beneath, oblong-lanceolate to narrowly ovate-lanceolate, petioled at the tapering base; flowers purple.....2. *E. maculatum* var. *bruneri*

**1. E. perfoliatum** L. Thoroughwort

Specimens have been seen from the following localities: Sundown, about 60 miles southeast of Winnipeg, swampy ground (Scoggan, 1953); "Lake of the Woods, Man." (Dawson, 1873); Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1921); Victoria Beach, about 55 miles north-northeast of Winnipeg (Marquardt, 1931; Rook, 1936; Breitung, 1949, wet roadside; Scoggan, 1953, thicket); Muskeg Island, Lake Winnipeg, low woods (Macoun, 1884). First report: Lake of the Woods [Dawson, 1875].

Temperate eastern American: se. Man. to Que., s. to Tex. and Fla.

**2. E. maculatum** L. var. **bruneri** (Gray) Breitung (*E. bruneri* Gray; *E. rydbergii* Britt.) Joe-Pye-weed

Thickets, wet ground, and shores in the southern half of the province. Northernmost collection: Hill Lake, north of Lake Winnipeg, limestone ledges at entrance of Minago River (Scoggan, 1948). Earliest collection seen: Brandon, wet places (Macoun, 1896). First report: the present publication. Basis of reports of the main form, with less pubescent leaves, and of *E. purpureum* L. from the province.

Temperate American: B.C. to Man., s. to N.M., Ia., and O.

### 3. LIATRIS Schreb.

(Blazing-star)

1. Heads cylindric or subcylindric, sessile in a dense spike; phyllaries long-ciliate, acute; pappus plumose; leaves linear.......................................1. *L. punctata*
1. Heads hemispherical, peduncled in a raceme; phyllaries ovate to suborbicular, the middle and upper ones strongly erose to toothed; pappus barbellate; leaves narrowly lanceolate, or the upper ones linear..................................2. *L. ligulistylis*

**1. L. punctata** Hook. (*Lacinaria punctata* (Hook.) Ktze.)

Dry prairie and sandhills of southern Manitoba. Northernmost collection: St. Lazare, about 75 miles northwest of Brandon, sandhills (Scoggan, 1951); but noted as far north as Bield, about 110 miles northwest of Brandon. Earliest collection seen: Fort Garry, dry gravelly knolls (Macoun, 1872). First report: Red River and Turtle Mountain [Dawson, 1875].

Temperate western American: Sask. and Man., s. to N.M. and Tex.

Forma *albiflora* Sheldon, with white florets, is represented by a specimen in the herbarium of the Division of Botany and Plant Pathology, Department of Agriculture, Ottawa, collected on sandy prairie of Souris Co. by T. L. Walker in 1889.

**2. L. ligulistylis** (Nels.) K. Schum. (*Lacinaria ligulistylis* Nels.)

Dry to moist prairie and open ground in the southern half of the province. Northernmost collection: Cranberry Portage, about 20 miles southeast of Flin Flon (Freedman, 1950). Earliest collection seen: Fort Garry (Schultz, 1861). First report: "Manitoba" [Shinners, Amer. Midland Nat. 29: 39. 1943]. Basis of reports of *L. scariosa* (L.) Willd. and *L. aspera* Michx. from the province.

Temperate western American: Alta. to central Man. and n. Wisc., s. to N.M. and S.D. A map of the distribution is given by Shinners [Amer. Midland Nat. 29: 30 (map 6). 1943].

Forma *leucantha* Shinners, with white florets, is represented in the herbarium of the Division of Botany and Plant Pathology, Dept. of Agric., Ottawa, by an undated collection made by W. A. Burman at Griswold, about 20 miles west of Brandon.

### 4. GRINDELIA Willd.

1. **G. squarrosa** (Pursh) Dunal (Incl. var. *serrulata* (Rydb.) Steyerm. and var. *quasiperennis* Lunell (*G. perennis* Nels.)) Curlycup-Gumweed

Dry to moist prairie and open ground, often alkaline, in the southern half of the province. Northernmost collection: The Pas, stockyards (Krivda, 1949). Earliest collection seen: near Fort Garry, salt plains (Macoun, 1872). First report: "First Crossing Souris River", west of Turtle Mountain [Dawson, 1875].

Temperate western American: B.C. to Man., s. to Nev. and Tex.; adventive farther eastward.

### 5. GUTIERREZIA Lag.

### (Broom-Snakeroot)

1. Leaves linear, 1·2-3 mm. wide....................................1. *G. diversifolia*
1. Leaves linear-filiform, less than 1 mm. wide..........................2. *G. sarothrae*

1. **G. diversifolia** Greene

Specimens have been seen from the following localities: Stony Mountain, near Winnipeg, dry rocky soil (Macoun, 1896); Baldur, about 45 miles southeast of Brandon (Criddle, 1926); Reston, about 55 miles west southwest of Brandon, gravelly prairie (Dudley, 1930; Scoggan, 1951); Virden, about 40 miles west of Brandon, gravelly prairie (Scoggan, 1951); Millwood, about 85 miles northwest of Brandon, dry prairie slope (Scoggan, 1951). First report: Lyleton [Lowe, 1943].

Temperate western American: Sask. and s. Man., s. to Wyo., N.M., and Kans. Scarcely specifically distinct from the following species.

2. **G. sarothrae** (Pursh) Britt. & Rusby (*G. euthamiae* T. & G.)

Dry prairie of southern Manitoba. Northernmost collection: Stony Mountain, north of Winnipeg (Lowe, 1934; Groh, 1934; Garton, 1946, dry gravelly banks; Scoggan, 1951, dry gravelly soil). Earliest collection seen: Turtle Mountain, dry open prairie (Burgess, 1874). First report: Turtle Mountain [Macoun, 1884].

Temperate western American: Sask. and Man., s. to Calif. and Tex.

### 6. CHRYSOPSIS Ell.

### (Golden Aster)

1. Leaves appressed-pubescent...........................................1. *C. villosa*
1. Leaves sparingly to copiously hirsute or hispid with spreading pubescence, their surfaces bearing resinous granules...........................................2. *C. hispida*

**1. C. villosa** (Pursh) Nutt. (*C. hirsutissima* Greene; *C. bakeri* Greene; *C. ballardi* Rydb.)

Dry prairie and sandhills of southern Manitoba. Northernmost collection: Bield, about 110 miles northwest of Brandon, isolated prairie hills (Scoggan, 1951). Earliest collection seen: Turtle Mountain, open gravelly prairie (Burgess, 1873). First report: "Rising ground east of Red River prairie" and "Turtle Mountain (open prairie)" [Dawson, 1875].

Temperate western American: B.C. to s. Man., s. to Ariz. and w. Ind.

**2. C. hispida** (Hook.) DC.

Specimens have been seen from the following localities: Melita, about 60 miles southwest of Brandon (Jackson, 1921; Scoggan, 1953, dry prairie); Broomhill, about 55 miles southwest of Brandon, dry prairie (Scoggan, 1953). First report: Virden [Lowe, 1943].

Temperate western American: B.C. to s. Man., s. to Calif., N.M., and S.D.

### 7. Solidago L.

### (Goldenrod)

1. Inflorescence corymbiform.

  2. Leaves linear to narrowly lanceolate, minutely punctate, all sessile, the lowermost not longer than the median ones; heads mostly sessile or subsessile .................... 13. *S. graminifolia* var. *major*

  2. Leaves broader, not punctate, the basal ones long-petioled and much longer than the upper ones; heads distinctly pedicelled.

    3. Leaves glabrous except for ciliate margins, conspicuously reticulate-veined; stems villous-puberulent, at least above; involucres 5-7 mm. high; plant of the Hudson Bay and low-northern regions .................... 3. *S. multiradiata*

    3. Leaves densely greyish-pubescent, firm, entire or nearly so; stem puberulent; involucres 6-8 mm. high; chiefly dry prairie habitats .................... 12. *S. rigida*

1. Inflorescence racemose or racemose-paniculate, or of axillary clusters.

  4. Heads spirally arranged; basal leaves much larger than the middle and upper ones.

    5. Achenes glabrous or nearly so.

      6. Rays silvery-white, rarely cream-colour .................... 1. *S. bicolor*

      6. Rays yellow.

        7. Leaves, at least the basal ones, pilose upon both surfaces.

          8. Stems pilose .................... 2. *S. hispida*

          8. Stems woolly or densely villous, especially above . . 2a. *S. hispida* var. *lanata*

        7. Leaves glabrous; stems glabrous, at least below.

          9. Involucres 4-6 mm. high; leaves rather fleshy, the blades of the basal ones about equalled by their petioles; plant of peaty or damp habitats .................... 6. *S. purshii*

          9. Involucres 3-4·5 mm. high; leaves scarcely fleshy, the blades of the basal ones exceeding their petioles; plant of dry prairie habitats .................... 5. *S. missouriensis*

    5. Achenes pubescent.

      10. Pedicels and branches of inflorescence pubescent; achenes pilose; stems commonly tufted, non-stoloniferous .................... 4. *S. decumbens* var. *oreophila*

      10. Pedicels and branches of inflorescence glabrous or sparsely pubescent; achenes sparsely hairy; stems commonly solitary, with creeping rhizomes .................... 5. *S. missouriensis*

  4. Heads 1-sided along the upper side of the branches of the inflorescence.

    11. Basal leaves much longer than the middle and upper ones, often forming a rosette.

12. Stem and leaves ashy with minute close puberulence; achenes pubescent... ........................................8. *S. nemoralis* var. *decemflora*
12. Stem and leaves glabrous or pilose or hirsute, not ashy-pubescent; achenes glabrous or pubescent.
    13. Leaves clearly 3-nerved; base of plant with elongate slender stolons....... ............................................5. *S. missouriensis*
    13. Leaves not clearly 3-nerved; slender stolons usually lacking....7. *S. juncea*

11. Basal leaves not much longer than the stem-leaves and rarely forming a rosette.
    14. Leaves pinnately veined, more or less strongly serrate.............*S. rugosa*
    14. Leaves more or less strongly triple-nerved (with 2 basal lateral veins prolonged parallel to midrib).
        15. Plant ashy with minute close puberulence; leaves thickish and firm; involucres 3·5-6·5 mm. high; achenes pubescent...............9. *S. mollis*
        15. Plant not ashy-puberulent; leaves thinner; involucres 2-4 mm. high.
            16. Summit of stem below the inflorescence glabrous or only sparsely pubescent.
                17. Leaves pilose, at least on the veins beneath; mature achenes often glabrous..........................................*S. gigantea*
                17. Leaves glabrous on both sides; mature achenes usually pubescent.. ................................11. *S. gigantea* var. *leiophylla*
            16. Summit of stem below the inflorescence densely pilose; achenes pubescent.
                18. Leaves green and essentially glabrous............10. *S. canadensis*
                18. Leaves greyish with scabrous puberulence on both sides.......... ..........................10a. *S. canadensis* var. *gilvocanescens*

1. **S. bicolor** L. White Goldenrod. Silverrod

Specimens appearing referable here have been seen from the following localities: Pine Ridge, near Winnipeg (Neatby, 1929); Gimli, about 45 miles north of Winnipeg (Jackson, 1923); Victoria Beach, about 55 miles north-northeast of Winnipeg (Jackson, 1921); Onah, about 20 miles east of Brandon (Criddle, 1926); Aweme, about 20 miles southeast of Brandon (no data); Minitonas, north of Duck Mountain (Taylor, 1929). It is a species of sterile open soil and thin woods. First report: Gimli and Victoria Beach [Lowe, 1943].

Temperate eastern American: s. Man. to C.B., s. to Ark. and Ga.

2. **S. hispida** Muhl.

Dry woodlands and rocky habitats in the southern two-thirds of the province. Northernmost collection: Nelson River at Limestone Rapids, about 155 miles south of Churchill, railway clearing (Scoggan, 1949). Earliest collection seen: Doghead Point, at the north end of The Narrows, Lake Winnipeg, dry thickets (Macoun, 1884). First report: Jackson *et al.* [1922].

(Subarctic-)temperate eastern American: Man. to Nfld., s. to Ark. and Ga.

2a. **S. hispida** var. **lanata** (Hook.) Fern. (*S. lanata* Hook.)

Specimens have been seen from the following localities: Riding Mountain (Scamman, 1941); Duck Mountain (Scoggan & Baldwin, 1950, roadside clearing and clay-gravel beach of Blue Lake); Porcupine Mountain (Scoggan & Baldwin, 1950, dry clearing and white spruce woods); The Pas, gravel railway ballast (Krivda, 1950); Flin Flon, rock outcrop (Scoggan, 1951); Wabowden, about 135 miles northeast of The Pas, clay soil (Gillett, 1948); Gillam, about 165 miles south of Churchill, railway clearing (Gillett, 1948). First report: the present publication.

(Subarctic-)temperate eastern American: Sask. to n. Man. and Nfld., s. to Me.

3. **S. multiradiata** Ait.

Rock outcrops, shores, muskeg forest, and clearings in the northern half of the province, except the extreme north. Northernmost collection: Churchill (several collections, the earliest by McTavish in 1853). Southernmost collection: Cross Lake, northeast of Lake Winnipeg, trail through woods (Scoggan, 1948). Earliest collection seen: the foregoing McTavish specimen from Churchill. First report: shore of Hudson Bay between York Factory and Churchill [Bell, 1884].

Arctic American: n. Alaska, nw. Mack., and Victoria I. to n. Man., s. Baffin I., n. Que., n. Lab., and Nfld., s. to Calif., Ariz., Colo., James Bay, and e. Que. A map of the greater part of the distribution is given by Raup [1947, pl. XXXV].

4. **S. decumbens** Greene var. **oreophila** (Rydb.) Fern. (*S. oreophila* Rydb.)

Specimens appearing referable here have been seen from the following localities: Sandilands Forest Reserve, sandy pine woods (Breitung, 1949); "Norway House to Canada" (Richardson, undated, but presumably collected during the Franklin expeditions of 1819–22); Gillam, about 165 miles south of Churchill, dry places (Core, 1948); Nelson River at Limestone Rapids, about 155 miles south of Churchill, railway clearing (Scoggan, 1949). First report: the present publication. The citation of the main form from Aweme by Lowe [1943] is probably referable to the following species. This species is admitted with some hesitation into our flora, and requires further collecting and study.

Subarctic western American: central Alaska and nw. Mack. to north-central Man., s. to Ariz. and N.M.; n. Mich.

5. **S. missouriensis** Nutt.

Dry prairie, sandhills, and clearings in the southern half of the province. Northernmost collection: The Pas, under spruces in sandy soil (Krivda, 1953). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Turtle Mountain, open prairie [Dawson, 1875]. Some of the Manitoba material appears to be referable to var. *fasciculata* Holzinger (var. *glaberrima* (Martens) Rosendahl & Cron.; *S. glaberrima* Martens), a generally larger plant with glabrous or sparingly short-hispid achenes.

Temperate western American: s. B.C. to Man. and Wisc., s. to Oreg., Ariz., Okla., and Mo.

6. **S. purshii** Porter (*S. uliginosa* of auth., not Nutt.; *S. humilis* Pursh; *S. chrysolepis* Fern.)

Specimens appearing referable here have been seen from the following localities: "Plains of Manitoba" (W. M. Canby, 1897, low ground; determined by Fernald); Marchand, about 40 miles southeast of Winnipeg, swampy ground (Breitung, 1949); Whiteshell Forest Reserve, east of Winnipeg, muskeg forest of black spruce and tamarack (Scoggan, 1951); Lac du Bonnet, about 50 miles northeast of Winnipeg, swampy ground (Breitung, 1949). First report: "Manitoba" [Fernald, Rhodora 49: 294. 1947]. Probable basis of the listing of varieties of *S. humilis* by Burman [1910] and Jackson *et al.* [1922], and of *S. uliginosa* Nutt. by Lowe [1943].

Subarctic eastern American: Man. to n. Que., n. Lab., and Nfld., s. to Minn., Ind., and Pa.

7. **S. juncea** Ait.

Specimens appearing referable here have been seen from the following localities: Sandilands Forest Reserve southeast of Winnipeg (Breitung, 1949, sandy pine woods; Scoggan, 1953, sandy jack-pine woods); Whiteshell Forest Reserve, east of Winnipeg, dry granite outcrops (Scoggan, 1951); Victoria Beach, about 55 miles north-northeast of Winnipeg (Jackson, 1921; Garton, 1944); Riding Mountain (Heimburger, 1939). First report: Jackson *et al.* [1922].

Temperate eastern American: Sask. to C.B., s. to Mo., Tenn., and Ga.

8. **S. nemoralis** Ait. var. **decemflora** (DC.) Fern. (*S. pulcherrima* Nels.)

Dry to moist prairie, sandhills, rock outcrops, and clearings in the southern two-fifths of the province. Northernmost collection: in a gravel pit 40 miles south of The Pas (Krivda, 1954). Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: Lowe [1943]. Basis of citations of the main form from the province.

Temperate western American: Alta. to w. Ont., s. to Ariz., Tex., Ark., and Ky.

9. **S. mollis** Bartl.

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg (Marshall, 1939, gravelly hill; 1941, moist soil; 1942, gravelly hill); Glenboro, about 35 miles southeast of Brandon, sandy prairie (Scoggan, 1951); Treesbank, about 20 miles southeast of Brandon (Criddle, 1906); Brandon, dry open places (Groh, 1932); Melita, about 60 miles southwest of Brandon (Doxtator, 1924; Scoggan, 1951, 1953, dry sandy prairie). First report: Jackson *et al.* [1922].

Temperate western American: Mont., Sask., and Man., s. to N.M. and Kans.

10. **S. canadensis** L. (Incl. *S. altissima* L. and *S. elongata* Nutt. (*S. lepida* DC. var. *elongata* (Nutt.) Fern.)) [*See* Gleason, 1952, p. 546].

Thickets, rock outcrops, shores, and clearings in the southern three-quarters of the province. Northernmost collection: York Factory

(McTavish, 1854; Scoggan, 1949, clay soil of landslide gully). Earliest collection seen: the foregoing McTavish specimen from York Factory. First report: Fort Garry [Schultz, 1861]. Probable basis of the citation of *S. procera* Willd. from near York Factory by Richardson ["H", in Franklin, 1823].

(Subarctic-)temperate American: B.C. to Nfld., s. to N.M., Tex., and Fla.

10a. **S. canadensis** var. **gilvocanescens** Rydb. (*S. gilvocanescens* (Rydb.) Smyth; *S. pruinosa* Greene)

Similar habitats in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, railway clearing (Gillett, 1948). Earliest collection seen: Fort Garry (Schultz, 1860). First report Dauphin, Morden, and Rossburn [Lowe, 1943]. Probable basis of the listing of *S. dumetorum* Lunell by Lowe.

Temperate American: Sask. and Man. to Mich., s. to Utah, N.M., Kans., and Va.

11. **S. gigantea** Ait. var. **leiophylla** Fern. (*S. serotina* Ait.)

Thickets and shores in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, rocky island (Scoggan, 1948). Earliest collection seen: Norway House (McTavish, undated, but probably 1853-54). First report: "Plains of the Red River" [Macoun, 1884]. A small part of the Manitoba material has the leaves sparingly pilose on the midribs beneath, and thus approaches the typical form, although the achenes of all such specimens seen retain the pubescence characteristic of var. *leiophylla.*

Temperate American: B.C. to Que., s. to Oreg., Utah, Tex., Tenn., and N.C.

12. **S. rigida** L. (Incl. var. *humilis* Porter (var. *canescens* (Rydb.) Breitung; *Oligoneuron canescens* Rydb.); *O. rigidum* (L.) Small)

Prairie, sandhills, and clearings of southern Manitoba. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, limestone substratum (Scoggan, 1951). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: Turtle Mountain [Dawson, 1875].

Temperate American: Wash. and Alta. to Ont. and Mass., s. to N.M., Tex., La., and Ga.

13. **S. graminifolia** (L.) Salisb. var. **major** (Michx.) Fern. (var. *tricostata* (Lunell) Harris; *Euthamia camporum* Greene var. *tricostata* Lunell)

Open, usually moist ground, in the southern three-quarters of the province. Northernmost collection: York Factory, gravel beach and floodplain of Hay Island (Scoggan, 1949). Earliest collection seen: Norway House (McTavish, probably 1853–54). First report: the present publication. Probable basis of reports of the main form and other varieties from the province, although further study is necessary before the occurrence of more than one entity in the province can be established definitely. Basis of reports of *S. lanceolata* L. and *S. tenuifolia* Pursh from Manitoba.

(Subarctic-)temperate American: s. B.C. to north-central Man. and Nfld., s. to N.M., S.D., Mich., and e. Que.

*S. rugosa* Ait. is cited from near Aweme by Criddle [1927] and is listed by Lowe [1943] on the basis of the inclusion of Manitoba in the range assigned the species by Rydberg [1932]. No specimens have been seen, however, and it should be excluded from our flora for the present.

*S. ulmifolia* Muhl., resembling *S. rugosa* in its pinnately-veined leaves, but with stem glabrous below the inflorescence, is cited from near Carberry by Shimek [1927], but no specimens have been seen, and it should be excluded from our flora.

*S. speciosa* Nutt. is cited from Waugh, near the Ontario boundary east of Winnipeg, by Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora.

## 8. HAPLOPAPPUS Endl.

1. Plant greyish with a floccose pubescence; leaves pinnatifid, their lobes and teeth bristle-tipped; phyllaries bristle-tipped....................................1. *H. spinulosus*
1. Plants green; leaves simple; phyllaries not bristle-tipped.
    2. Leaves mostly basal, entire......................................*H. armerioides*
    2. Leaves cauline and basal, mostly with a few sharp teeth................*H. lanceolatus*

1. **H. spinulosus** (Pursh) DC. (*Aplopappus spinulosus*; *Sideranthus spinulosus* (Pursh) Sweet)

Specimens have been seen from the following localities: Turtle Mountain, dry prairie (Burgess, 1873); "Manitoba West" (Macoun, 1875); Brandon Co., dry hills (Burman, undated); Brandon (Stevenson, 1953); Aweme, about 20 miles southeast of Brandon (Criddle, 1911); Melita, about 60 miles southwest of Brandon, dry prairie (Senn & Gordon, 1946; Scoggan, 1951); Coulter, about 70 miles southwest of Brandon, dry prairie (Scoggan, 1951); Rossburn, about 65 miles northwest of Brandon, prairie slope (Scoggan, 1951); Millwood, about 85 miles northwest of Brandon, prairie slope (Scoggan, 1951). First report: Turtle Mountain and "First Crossing Souris River" [Dawson, 1875].

Temperate western American: Alta. to sw. Man., s. to Tex. and Mex.

*H. armerioides* (Nutt.) Gray (*Stenotus armerioides* Nutt.) is listed by Lowe [1943] on the basis of the inclusion of Manitoba in the range assigned the species by Rydberg [1932]. No specimens have been seen, however, nor is it accredited to the province in the monograph of the genus by Hall [Carnegie Inst, Wash., Pub. No. 389: 162-164. 1928]. It should be excluded from our flora for the present.

*H. lanceolatus* (Hook.) T. & G. is stated by Macoun [1884] to occur "On saline marshy prairie, not uncommon, from Manitoba westward to the base of the Rocky Mountains". No Manitoba specimens have been seen, however, nor is it accredited to the province by Hall. It should be excluded from our flora.

## 9. BOLTONIA L'HÉR.

1. **B. asteroides** (L.) L'Hér. var. **recognita** (Fern. & Grisc.) Cron. (*B. latisquama* Gray var. *recognita* Fern. & Grisc.)

Specimens have been seen from the following localities: Headingly, near Winnipeg (Burman, 1897); Rosser, west of Winnipeg (Denike, 1940);

"10 miles west from Winnipeg, rich damp soil" (Fletcher, 1886); "About 15 miles from Winnipeg, low ground in open thicket" (Fletcher, 1886); Morris, about 35 miles south of Winnipeg (Macoun, 1896, open prairie; Scoggan, 1953, wet ditch); Souris Co. (Walker, 1889); Melita, about 60 miles southwest of Brandon, wet ditch (Scoggan, 1951); Lauder, about 45 miles southwest of Brandon, wet ground (Scoggan, 1951). Reported also from Aweme and Stony Mountain by Lowe [1943]. First report: "Manitoba" [Fernald, Rhodora 42: 491. 1940]. Basis of reports of the main form from the province.

Temperate eastern American: s. Man. to Mich., s. to Kans., Mo., and Ky.; adventive farther eastward.

## 10. ASTER L.

(Aster)

1. Ligules of the marginal florets wanting or rudimentary; phyllaries glabrous or the outer ones merely ciliate at base; leaves linear-attenuate, entire, dry and scabrous; annual plant with only fibrous roots........................................1. *A. brachyactis*

1. Ligules conspicuous, white or variously coloured; perennial plants with stout bases or creeping rhizomes.

2. Pappus double, consisting of an inner series of long bristles and an outer series of short ones; phyllaries pubescent; inflorescence a flattish-topped corymb; leaves lanceolate to ovate, entire, tapering to base and apex....2. *A. umbellatus* var. *pubens*

2. Pappus a single series of bristles.

3. Involucres and branches of the corymbose or subcorymbose inflorescence glandular-hairy.

4. Leaves strongly toothed, the lower ones cordate at base and petioled......................................................3. *A. macrophyllus*

4. Leaves entire or remotely toothed.

5. Leaves linear, entire, sessile but scarcely clasping, the lower ones long-petioled; plant of salt marshes and saline soil........................4. *A. pauciflorus*

5. Leaves lanceolate, all of them sessile by a clasping base.

6. Leaves entire, strongly auriculate-clasping, mostly broadest near the middle; peduncles short, the inflorescence relatively compact.........................................................6. *A. novae-angliae*

6. Leaves, at least the lower ones, distantly but sharply toothed, less strongly clasping, mostly broadest below the middle and long-acuminate; peduncles elongate, the inflorescence loose and open..................7. *A. modestus*

3. Involucres and branches of the inflorescence non-glandular.

7. Inflorescence a flattish-topped corymb; phyllaries leathery in texture, scarious-margined.

8. Leaves linear or linear-oblanceolate, with 2 or 4 veins running from near base parallel with midrib; ligules white......................5. *A. ptarmicoides*

8. Leaves linear to broadly lanceolate or oblanceolate, with pinnate venation; ligules yellowish........................5a. *A. ptarmicoides* var. *lutescens*

7. Inflorescence racemose or racemose-paniculate; at least the outer phyllaries herbaceous or with herbaceous tips, not strongly scarious.

9. At least the lower leaves cordate and definitely petioled.

10. Phyllaries appressed, obtuse or obtusish, with broad green or purplish median band near tip; principal stem-leaves on slender petioles.........................................................8. *A. cordifolius*

10. Phyllaries loosely ascending, acute to attenuate, with median band narrow to tip; leaf-petioles narrowly or broadly winged.............9. *A. ciliolatus*

9. None of the leaves at once cordate and definitely petioled.

11. Stem-leaves strongly auriculate-clasping.
    12. Stem and leaves glaucous and quite glabrous, the leaves very smooth and leathery; phyllaries firm, tightly appressed, with rhombic green summits; ligules violet; achenes glabrous................10. *A. laevis*
    12. Stem and leaves not glaucous, the former more or less hirsute with often tuberculate-based hairs; phyllaries herbaceous, loose, the outer ones often broad and foliaceous; ligules blue-violet to lilac or pink; achenes pubescent...............................11. *A. puniceus*
11. Stem-leaves tapering to rounded at base, scarcely clasping.
    13. Leaves whitened with a dense silvery-silky pubescence on both sides, sessile, entire; phyllaries resembling the upper reduced stem-leaves; ligules bluish to purple-violet; achenes glabrous; plant of dry prairie habitats.........................................12. *A. sericeus*
    13. Leaves green, of various forms; phyllaries mostly normal; achenes mostly minutely pubescent.
        14. Leaves linear, mostly less than 2 cm. long, rather rigid, they and the outer phyllaries bristle-tipped and bristly-ciliate; ligules 3-6 mm. long, white (rarely blue or roseate).
            15. Involucre 3·5-5 mm. high, its phyllaries in 3 or 4 distinct series; heads rather numerous in dense 1-sided racemes...............13. *A. pansus*
            15. Involucre 5-8 mm. high, its phyllaries about equal in length; heads few or solitary at the ends of the branches...............14. *A. falcatus*
        14. Leaves 5-20 cm. long, relatively thin, glabrous or nearly so, they and the phyllaries neither bristle-tipped nor bristly-ciliate.
            16. Heads in narrow 1-sided racemes forming a panicle; involucres 4-6·6 mm. high; ligules white, 4·5-7·5 mm. long...............15. *A. lateriflorus*
            16. Heads regularly disposed; ligules mostly longer.
                17. Involucres 8-12 mm. high, their subequal phyllaries 1-2 mm. broad; ligules violet or bluish, 10-15(-20) mm. long; leaves entire or shallowly toothed.............16. *A. johannensis*
                17. Involucres 4·5-8 mm. high, their 3-5-seriate phyllaries 0·5-1 mm. broad; leaves essentially entire.
                    18. Leaves narrowly linear, with harshly scabrous margins; rootstocks 0·8-2 mm. thick; ligules purple, roseate, or white, about 1 cm. long.............17. *A. junciformis*
                    18. Leaves broader, their margins not strongly scabrous; rootstocks 2-6 mm. thick.
                        19. Veinlets of leaves conspicuous, enclosing roughly isodiametric spaces; ligules blue-violet or purple, 6-15 mm. long.....................18. *A. praealtus*
                        19. Veinlets less evident, enclosing elongate spaces; ligules white, 6-11 mm. long..........19. *A. simplex*

1. **A. brachyactis** Blake (*A. angustus* (Lindl.) T. & G., not Nees; *Brachyactis angusta* (Lindl.) Britt.)

Specimens have been seen from the following localities: Winnipeg (Fowler, 1939; Denike, 1940, river beds and mud; Denike, 1944); Matlock Beach, at the south end of Lake Winnipeg (Marquardt, 1931); Crystal City, about 60 miles south-southwest of Portage la Prairie (Thomas, 1935); Cypress River, about 45 miles southwest of Portage la Prairie (Denike, undated); Sidney, about 40 miles east of Brandon (Bird, 1949); Cartwright, east of Turtle Mountain, roadside (Senn & Gordon, 1946); Aweme, about 20 miles southeast of Brandon (Criddle, 1911); Brandon (Stevenson, 1950); west side of Lake Manitoba (Groh, 1922); Melita, about 60 miles southwest of Brandon, dry alkaline prairie (Scoggan, 1951); Virden, about 45 miles west of Brandon, thicket (Scoggan, 1951); Hamiota, about 35 miles northwest of Brandon (McConnell, 1941); The Pas (Jackson, 1922); Wabowden, about 135 miles northeast of The Pas, roadside in pine woods (Core, 1948). First report: near Aweme [Criddle, 1927].

Temperate American: Alta. to central Man., the Great Lakes region, and Que., s. to Utah, Colo., S.D., Mo., Minn., and N.Y.; a small area also in central Asia.

2. **A. umbellatus** Mill. var. **pubens** Gray (*A. pubentior* Cronq.; *Doellingeria pubens* (Gray) Rydb.)

Thickets and meadows in the southern quarter of the province. Northernmost collection: Swan River, north of Duck Mountain, grassland (Scoggan, 1951). Earliest collection seen: Turtle Mountain, damp thicket (Burgess, 1873). First report: Riding Mountain [Halliday, 1932]. Basis of reports of the main form (*Doellingeria umbellata* (Mill.) Nees) from the province.

Temperate American: Alta. to n. shore of L. Sup., s. to Neb. and Mich.; replaced farther east by the main form.

3. **A. macrophyllus** L.

Specimens have been seen from the following localities: "Lake Winnipeg" (Richardson; undated, but presumably collected during the Franklin expeditions of 1819–22); Whiteshell Forest Reserve, east of Winnipeg, white spruce woods (Scoggan, 1951, sterile specimen consisting of 3 basal leaves). These specimens, through their pubescence, are probably referable to either var. *velutinus* Burgess or var. *sejunctus* Burgess. First report: Turtle Mountain [Dawson, 1875]. The citation from Norway House by Macoun [1884] remains to be verified. Probable basis of the listing of *A. divaricatus* L. by Lowe [1943].

Temperate eastern American: se. Man. to e. Que., s. to Minn., Ill., and N.C. A map of the distribution is given by Fernald [Rhodora 13: 140 (f), pl. 90, map 11. 1911].

4. **A. pauciflorus** Nutt.

Specimens have been seen from the following localities: Shoal Lake, about 50 miles northwest of Brandon, alkaline flats 10 miles north of town (Scoggan, 1953); Camperville, west coast of Lake Winnipegosis northeast of Duck Mountain, salt marsh (Scoggan, 1951); Red Deer River, near Dawson Bay, Lake Winnipegosis (Macoun, 1881); Dawson Bay, Lake Winnipegosis, salt marsh, Salt Point (Scoggan, 1948). Noted also on alkaline prairie 8 miles south of Morden. First report: "Very abundant in salt marshes along Lake Winnipegoosis, and up the Red Deer River ..." [Macoun, 1884].

Temperate western American: Sask. and Man., s. to Ariz. and Tex.

5. **A. ptarmicoides** (Nees) T. & G. (*Unamia alba* (Nutt.) Rydb.)

Prairie, sandhills, rock outcrops, and clearings in the southern half of the province. Northernmost collection: 40 miles south of The Pas (Core, 1948). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: Stony Mountain, Red River, and "Along the Assiniboine, near Brandon and on the Red Deer River, at the head of Lake Winnipegoosis." [Macoun, 1884].

Temperate American: Sask. to N.B., s. to Wyo., Colo., Mo., and N.Y.

5a. **A. ptarmicoides** var. **lutescens** (Lindl.) Gray (*A. lutescens* (Lindl.) T. & G.; *Unamia lutescens* (Lindl.) Rydb.)

Specimens apparently referable here have been seen from the following localities: Inwood, about 40 miles west-northwest of Winnipeg (Dudley, 1929); Glenboro, about 35 miles southeast of Brandon (Burman, 1888); Killarney, northeast of Turtle Mountain (Macoun, 1896); Brandon (Groh, 1922, saline soil; Stevenson, 1950, dry soil). First report: "On dry elevated ground of the Assiniboine River, Man." [Macoun, 1884].

Temperate (interior) American: Sask. to Bruce Pen., Ont., s. to S.D. and Ill.

6. **A. novae-angliae** L. New England Aster

Thickets, meadows, and shores of southern Manitoba. Northernmost collection: Moosehorn, about 90 miles north of Portage la Prairie, thicket (Scoggan, 1951). Earliest collection seen: Brandon, borders of marshes (Macoun, 1884). First report: "Abundant in thickets from Portage la Prairie, westward to Brandon, Man." [Macoun, 1886].

Temperate American: s. Alta. to sw. Que., s. to Colo., Ark., and N.C.

7. **A. modestus** Lindl.

Specimens have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg, wet meadow at edge of woods (Breitung, 1949); Marchand, about 40 miles southeast of Winnipeg, roadside (Scoggan, 1953). First report: the present publication.

Subarctic American: s. Alaska and south-central Yukon to n. Alta. and James Bay, s. to Oreg. and n. Mich.

8. **A. cordifolius** L.

Specimens have been seen from the following localities: Winnipeg (Malte, 1917); Miami, about 40 miles south of Portage la Prairie, thicket (Scoggan, 1951); Swan Lake, about 45 miles southwest of Portage la Prairie (A. & D. Löve, 1953); Brandon (Bird, 1949); Grand Rapids, near the northwest end of Lake Winnipeg (Jackson, 1925). First report: Burman [1910].

Temperate eastern American: s. Man. to N.S., s. to Mo. and Ga.

9. **A. ciliolatus** Lindl. (*A. lindleyanus* T. & G.)

Light woods, thickets, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Gardner, 1930). Earliest collection seen: Red Deer River (Macoun, 1881). First report:

Doghead Point, Lake Winnipeg [Macoun, 1884]. Probable basis of the listing of *A. lowrieanus* by Lowe [1943].

Subarctic American: Great Bear L. to n. Man. and e. Que., s. to Mont., Wyo., S.D., and N.Y.

10. **A. laevis** L. (Incl. var. *geyeri* Gray)

Thickets, prairie, sandhills, and clearings in the southern half of the province. Northernmost collection: Hill Lake, north of Lake Winnipeg, gravel ridge 8 miles up Hargrave River (Scoggan, 1948). Earliest collection seen: Fort Garry (Schultz, 1860). First report: near Carberry [Christy, 1887].

(Subarctic-)temperate American: s. Yukon to central Man. and Me., s. to Oreg., N.M., and Ga.

11. **A. puniceus** L.

Thickets, meadows, and clearings in the southern three-quarters of the province. Northernmost collection seen: York Factory, landslide gully (Scoggan, 1949). The report of var. *demissus* Lindl. (f. *demissus* (Lindl.) Fern.; ligules roseate rather than blue-violet) from Churchill by Gardner [1937] requires further confirmation. Earliest collection seen: Winnipeg (Malte, 1917). First report: York Factory [Bell, 1881].

(Subarctic-)temperate American: n. Alta. to n. Que. and Nfld., s. to N.D., Ill., Ala., and Ga.

12. **A. sericeus** Vent.

Specimens have been seen from the following localities: Winnipeg (Fowler, 1939); Birds Hill, near Winnipeg (Lowe, 1918, 1919; Denike, 1943, 1946, gravel); Stony Mountain, near Winnipeg (Macdonald, 1939; Garton, 1946, roadside thickets, moist clay soil); Arnaud, about 40 miles south of Winnipeg, sandy area (Clarke, 1939). First report: Jackson *et al.* [1922].

Temperate eastern American: se. Man. to Ont. and n. Mich., s. to Tex., Mo., and Tenn.

13. **A. pansus** (Blake) Cronq. (*A. multiflorus* Ait. var. *pansus* Blake; *A. ericoides* of auth., not L.) [*See* Nelson, Rhod. 35: 323-327. 1933; Cronquist, Bull. Torrey Bot. Cl. 74: 144. 1947; Cronquist, Leaflets of Western Botany 6: 45. 1950].

Prairie, alkaline flats, and open ground in the southern two-fifths of the province. Northernmost collection: The Pas (Krivda, 1950). Earliest collection seen: "Trail to Red River" (Schultz, 1860). First report: the present publication; basis of reports of the eastern North American *A. ericoides* L. from the province, this latter with well-developed creeping rhizomes rather than with stems clustered from a mere caudex.

Subarctic western American: north-central Mack. to central Man., s. to Ariz., Colo., and Neb.

14. **A. falcatus** Lindl. (*A. commutatus* (T. & G.) Gray) [*See* Cronquist, Bull. Torrey Bot. Cl. 74: 144. 1947].

Specimens have been seen from the following localities: Stony Mountain, near Winnipeg (Groh, 1922; Scoggan, 1953, gravelly ground); Morden, about 60 miles southwest of Winnipeg, moist prairie (Senn & Gordon, 1946); Gladstone, about 45 miles northwest of Brandon (Morgan, undated); Glenboro, about 35 miles southeast of Brandon, sandy prairie (Scoggan, 1951); Treesbank, about 20 miles southeast of Brandon (Thomas, 1897); Brandon, dry places (Marshall, 1947). First report: Jackson *et al.* [1922].

Subarctic western American: Great Bear L. to s. Man., s. to Ariz., N.M., and Ill.

15. **A. lateriflorus** (L.) Britt. (Incl. var. *hirsuticaulis* (L.) Porter)

Specimens have been seen from the following localities: Marchand, about 40 miles southeast of Winnipeg, thicket (Scoggan, 1953); La Broquerie, about 35 miles southeast of Winnipeg (Budd & Lindsay, 1948); Winnipeg (Macoun, 1896, woods along Red River; Malte, 1917); Brokenhead, about 30 miles northeast of Winnipeg, sandy aspen bluff (Breitung, 1949); Victoria Beach, about 55 miles north-northeast of Winnipeg (Rook, 1938). First report: Jackson *et al.* [1922].

Temperate eastern American: se. Man. to e. Que., s. to Tex. and Fla.

16. **A. johannensis** Fern. (*A. longifolius* in large part of Am. auth., not Lam.)

Specimens apparently referable here have been seen from the following localities: Winnipeg (Denike, 1944); Shoal Lake, about 50 miles northwest of Brandon, roadside prairie (Scoggan, 1951); Flin Flon, ditches (Krivda, 1949); Wabowden, about 135 miles northwest of The Pas, clay soil (Gillett, 1948); Hayes River, about 80 miles southwest of York Factory, gravel beach (Scoggan, 1949); York Factory (McTavish, 1854); Nelson River near Gillam Island, gravel beach (Scoggan, 1949). First report: the present publication.

(Subarctic-)temperate eastern American: Man. to s. Lab. and Nfld., s. to s. Ont. and N.E.

17. **A. junciformis** Rydb. (Scarcely distinct from *A. junceus* Ait.) [*See* Hultén, 1950, p. 1493].

Swampy ground, muskeg forest, and shores throughout the province except the extreme north. Northernmost collection: Churchill (Macoun, 1910; Gillett, 1948, ditch by railway; Hyde, 1949, swampy flats). Earliest collection seen: "Height of land muskeg between Lake of the Woods and Red River, Man." (Dawson, 1873). First report: Sandilands and Victoria Beach [Lowe, 1943]. Basis of reports of *A. junceus* from the province, and probable basis of the citation of *A. nemoralis* Ait. from Churchill by Radforth [1950].

Subarctic American: central Alaska to Great Bear L., n. Man., and e. Que., s. to Calif., Colo., Ia., and Pa.

18. **A. praealtus** Poir. (*A. salicifolius* Ait., not Lam.; *A. coerulescens* DC.)

Thickets, wet ground, and shores in the southern four-fifths of the province. Northernmost collection: Churchill River, between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915). Earliest collection seen: Bloodvein River, north end of The Narrows, Lake Winnipeg, rock crevices (Macoun, 1884). First report: Burman [1910]. Probable basis of the citation of *A. novi-belgii* L. from Fort Garry and Waugh by Lowe [1943].

Temperate eastern American (incl. var. *angustior* Wieg.): Man. to s. Que., s. to e. Tex., Mo., Ky., and Md.

19. **A. simplex** Willd. (*A. paniculatus* Lam. var. *simplex* (Willd.) Burgess; incl. var. *ramosissimus* (T. & G.) Cronq. (*A. paniculatus* var. *bellidiflorus* (Willd.) Burgess))

Damp thickets, meadows, shores, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, damp soil near railway (Schofield, 1950). Earliest collection seen: Portage la Prairie (McMorine, 1896). First report: Lake Winnipeg [Jackson *et al.*, 1922]. Probable basis of most reports of *A. paniculatus* Lam. from the province.

(Subarctic-)temperate American: Sask. to Nfld., s. to Kans. and Va.

*A. anomalus* Engelm. is cited from Miles 75 and 160 of the Hudson Bay Railway by Gardner [1937], but no specimens have been seen, and the species should be excluded from our flora. The report may be referable to *A. ciliolatus* Lindl.

*A. conspicuous* Lindl. is cited from St. Lazare in the undated supplement to Lowe's 1943 checklist. No specimens of this western American species have been seen, however, and it should be excluded from our flora.

*A. vimineus* Lam. is listed by Lowe [1943], but without locality, and is cited from Carberry by Christy [1887]. No specimens have been seen, however, and it should be exlcuded from our flora..

*A. paludosus* Willd., cited from York Factory by Richardson ["H", in Franklin, 1823] is probably referable to one of the northerly species treated above.

### *Bellis* L.

*B. perennis* L., English Daisy, is listed by Burman, but does not appear in later checklists. It may occur as a mere waif, and is scarcely a naturalized element of our flora.

## 11. Townsendia Hook.

1. **T. exscapa** (Richards.) Porter

Specimens have been seen from the following localities: Cypress River, about 40 miles southeast of Brandon (Burman, undated); Glenboro, about 35 miles southeast of Brandon (McInnis, 1925); Aweme, about 20 miles southeast of Brandon, sandhills (Criddle, 1899, 1905; White, undated); Brandon (Noble, 1910; unknown collector, sandhills, 1924); Routledge, about 40 miles west of Brandon (Moody, 1930; Scoggan, 1953, sandhills). First report: Jackson *et al.* [1922]. Basis of reports of *T. sericea* Hook. from the province.

Temperate western American: se. Alta. to sw. Man., s. to Ariz. and Tex. A map of the distribution is given by Larsen [Ann. Mo. Bot. Gard. 14: 6 (pl. 1). 1927].

## 12. Erigeron L.

## (Fleabane)

[*See* Cronquist, 1947.]

1. Ligules inconspicuous, scarcely exceeding the disk; involucres (before drying) slenderly campanulate, 2·5-5 mm. long; heads small and very numerous in a narrow panicle; leaves bristly-ciliate........1. *E. canadensis*

1. Ligules mostly exceeding the disk; involucres saucer-shaped to hemispheric, 6-20 mm. broad.

2. Ligules slender, 0·2-0·55 mm. wide, becoming involute and often quite inconspicuous on drying.

3. Phyllaries glabrous or very sparsely hispid, they and the peduncles glandular-powdery and viscid........2. *E. acris* var. *asteroides*

3. Phyllaries and summits of peduncles copiously hispid or villous, glandless.

4. Stem-leaves linear-oblong, lanceolate, or oblanceolate; inflorescence corymb-like, the peduncles more or less spreading or spreading-ascending, or the head solitary........2a. *E. acris* var. *elatus*

4. Stem-leaves narrowly linear; inflorescence raceme-like, the peduncles erect or nearly so, or the head sometimes solitary........3. *E. lonchophyllus*

2. Ligules mostly 0·4-1·4 mm. wide, flat and conspicuous.

5. Involucre more or less densely woolly-villous, the hairs with conspicuous dark purple or blackish cross-walls; plant of the Churchill area........4. *E. humilis*

5. Involucre glabrous or, if hairy, the hairs without conspicuous coloured cross-walls; plants of the southern and low-northern regions.

6. Stem-leaves cordate-clasping; stem long-pilose below, soft and usually flattened in pressing; ligules pinkish to light rose-purple........5. *E. philadelphicus*

6. Stem-leaves not clasping; stem firm.

7. Stems slender, 1-1·5 mm. thick, densely tufted from a woody crown; leaves very numerous, linear to linear-oblanceolate, 1-4 mm. broad; heads solitary at the tips of stems or branches........6. *E. hyssopifolius*

7. Stems stouter; leaves less numerous, broader; heads mostly corymbose.

8. Plants annual, with fibrous roots; ligules white or sometimes purplish, about equalling the breadth of the disk, occasionally minute or wanting.

9. Leaves firm, entire or nearly so........7. *E. strigosus*

9. Leaves membranaceous, coarsely and sharply toothed........*E. annuus*

8. Plants perennial; ligules longer than breadth of disk.

10. Phyllaries thickened on the back; stems 0·5-3 dm. high, curved or decumbent at base; ligules white, blue, or sometimes pink........8. *E. cespitosus*

10. Phyllaries thin and pliable; stems 1-5(-7) dm. high.

11. Stems erect at base; ligules usually white........9. *E. asper*

11. Stems curved or decumbent at base; ligules usually purple........10. *E. glabellus*

1. **E. canadensis** L. (*Leptilon canadense* (L.) Britt.; *Conyza canadensis* (L.) Cronq.) Horse-weed

Fields, roadsides, and clearings in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, roadsides and clearings (Scoggan, 1949). Earliest collection seen: Doghead Point, at the north end of The Narrows, Lake Winnipeg (Macoun, 1884). First report: Nelson River [Bell, 1880].

(Subarctic-)temperate American: B.C. to Nfld., s. to Calif., Mex., and Fla.; widely introduced in Eurasia.

2. **E. acris** L. var. **asteroides** (Andrz.) DC. (*E. asteroides* Andrz.; *E. elongatus* Ledeb.; *E. angulosus* Gaud. var. *kamtschaticus* (DC.) Hara)

Specimens have been seen from the following localities: Doghead Point, at the north end of The Narrows, Lake Winnipeg, dry thickets (Macoun, 1884); Dawson Bay, Lake Winnipegosis, limestone cliffs of Wilkins Point (Scoggan, 1948); Grand Rapids, near the northwest end of Lake Winnipeg, open black spruce woods (Scoggan, 1948); Cross Lake, northeast of Lake Winnipeg, portage through spruce woods (Scoggan, 1948); The Pas (Krivda, 1951); Flin Flon, rock outcrop (Scoggan, 1951); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, roadsides and clearings (Scoggan, 1949); Bear Lake, northwest of Oxford Lake (Moore, 1953); Gillam, about 165 miles south of Churchill (Schofield, 1950); Nelson River at Limestone Rapids, about 155 miles south of Churchill, railway clearing (Scoggan, 1949); Reindeer Lake, sandy terrace at Brochet trading post (Baldwin, 1951); Herchmer, about 100 miles south of Churchill, railway gravel and cinders (Gillett, 1948); Nueltin Lake, lat. 59° 43′ N., sandy opening in black spruce woods (Baldwin, 1951); Churchill, gravel (Gillett, 1948). First report: York Factory [Macoun, 1884]. Probable basis of reports of the main form from the province, and of the listing of *E. jucundus* Greene (*E. acris* var. *debilis* Gray) by Lowe [1943].

Subarctic circumpolar: n. Alaska to Great Bear L., s. Keewatin, and s. Lab., s. to Oreg., Utah, Colo., Sask., and e. Que.; n. Eurasia. A map of the American distribution is given by Raup [1947, pl. XXXV].

2a. **E. acris** var. **elatus** (Hook.) Cronq. (var. *oligocephalus* Fern. & Wieg.; *E. elatus* Greene)

Specimens have been seen from the following localities: Souris River about 20 miles south of Brandon, prairie slope (Scoggan & Baldwin, 1950); Grande Clarière, about 40 miles southwest of Brandon, sandhills (Scoggan & Baldwin, 1950); Duck Mountain, roadside clearing (Scoggan & Baldwin, 1950); East Mossy Portage between Cedar Lake and Lake Winnipegosis (Scoggan, 1948); Grand Rapids, near the northwest end of Lake Winnipeg, limestone substratum (Scoggan, 1948); Hill Lake, north of Lake Winnipeg, sandy ridge about 8 miles up Hargrave River (Scoggan, 1948); The Pas (Krivda, 1950); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, trail through woods (Scoggan, 1949); Hayes River, about 100 miles southwest of York Factory, clay banks (Scoggan, 1949); Gillam, about 165 miles south of Churchill (Schofield, 1950); York Factory (McTavish, 1954; Bell, 1880; Scoggan, 1949, muskeg forest of black spruce and tamarack); Churchill (several collections, the first evidently by Macoun in 1910). First report: Churchill [Fernald, Rhodora 40: 347. 1938].

(Arctic-)subarctic American: n. Alaska and nw. Mack. to sw. Keewatin, n. Lab., and Nfld., s. to s. B.C. and e. Que. A map of the distribution is given by Raup [1947, pl. XXXV].

3. **E. lonchophyllus** Hook. (*E. minor* (Hook.) Rydb.)

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg (Groh, 1921); Winnipeg, bank of Red River (Macoun, 1896); Aweme, about 20 miles southeast of Brandon (Criddle, 1911); Carberry, about 25 miles east of Brandon, wet places (Fletcher, 1896); Minitonas, north of Duck Mountain, grassy clearing (Scoggan, 1951); Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground and limestone cobble beach (Scoggan, 1948); The Pas (Krivda, 1950); Gillam, about 165 miles south of Churchill (Simpson, 1942); Churchill (Porsild, 1930; 1953, roadside meadow). First report: Lowe [1943; based upon the inclusion of Manitoba in the range of *E. minor* by Rydberg, 1932].

Subarctic American: n. Alaska and central Yukon to n. Man., James Bay, and Anticosti I., s. to s. Calif., N.M., S.D., and s. Man. A map of the distribution (incomplete in the north and east) is given by Fernald [1925, p. 255, map 18].

4. **E. humilis** Graham (*E. unalaschkensis* (DC.) Vierh.)

A single specimen has been seen, from Churchill, where it was collected among dry vegetation on a limestone ridge by J. C. Ritchie in 1954. First report: the present publication. Basis of the report of *E. uniflorus* L. from Churchill by Radforth [1950].

(Arctic-)subarctic circumpolar: n. coast of Alaska, Yukon, and Mack. to s. Baffin and n. Lab., s. to B.C., Mont., n. Man., James Bay, and central Lab.; southern half of Greenland; n. Eurasia.

5. **E. philadelphicus** L. (*E. purpureus* Ait.)

Thickets, meadows, shores, and clearings in the southern four-fifths of the province. Northernmost collection: Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915). Earliest colection seen: High Bluff, near Portage la Prairie (Hargrave, 1883). First report: north end of Lake Winnipeg [Bell, 1880]. Probable basis of the citation of *E. bellidifolius* Muhl. (*E. pulchellus* Michx.) from near Carberry by Christy [1887].

(Subarctic-)temperate American: n. B.C. and sw. Mack. to n. Man., James Bay, and Nfld., s. to Calif. and Fla.

6. **E. hyssopifolius** Michx. (*Aster graminifolius* Pursh)

Open ground and shores in the northern three-quarters of the province, except the extreme north. Northernmost collection: Churchill River, rocky banks of streams (Bell, 1879). Southernmost collection: Cowan, near the northeast edge of Duck Mountain, damp ground (Scoggan & Baldwin, 1950). Earliest collection seen: York Factory (McTavish, 1853). First report: near York Factory ["H," Richardson, in Franklin, 1823; as *Aster graminifolius*].

Subarctic American: Great Bear L. to s. Keewatin, James Bay, and Nfld., s. to B.C., n. Mich., and N.Y.

**7. E. strigosus** Muhl. (*E. ramosus* (Walt.) BSP.)

Prairie, fields, and clearings of southern Manitoba. Northernmost collection: Steeprock, about 100 miles north of Portage la Prairie, limestone substratum (Scoggan, 1951). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: "Winipeg" [Bourgeau, in Palliser, 1863]. Probable basis of the citations of *E. annuus* (L.) Pers. from Fort Garry, and of *E. pumilus* Nutt. from Napinka and Stony Mountain, by Lowe [1943].

(Subarctic-)temperate American (incl. var. *septentrionalis* (Fern. & Wieg.) Fern.): B.C. to Nfld., s. to Calif., Ida., Okla., O., and S.C.

**8. E. cespitosus** Nutt.

Specimens have been seen from the following localities: (Marshall, 1949, dry hills; Stevenson, 1953, dry gravelly soil near gravel pit); Beulah, about 55 miles west-northwest of Brandon (Dennis, undated); St. Lazare, about 75 miles northwest of Brandon, sandy prairie clearing (Scoggan, 1953); Victor, about 80 miles northwest of Brandon, dry prairie (Scoggan, 1951). First report: "Frequent on dry gravelly knolls from Fort Ellice to the Rocky Mountains" [Macoun, 1884]. The citation from Winnipeg by Lowe [1943] is referable to *E. glabellus*. The citations from York Factory by Jackson *et al.* [1922] and Lowe [1943] are probably referable to some other species.

Subarctic western American: north-central Alaska and central Yukon to sw. Man., s. to Wash., Utah, Ariz., N.M., and w. Neb.

**9. E. asper** Nutt. (*E. glabellus* sensu Cronquist, not Nutt.)

Dry prairie, thickets, and open woods of southern Manitoba. Northernmost collection: Gypsumville, about 125 miles north of Portage la Prairie, dry jack-pine woods (Scoggan, 1951). Earliest collection seen: Turtle Mountain (Burgess, 1873). First report: Jackson *et al.* [1922].

Temperate western American: Sask. and Man., s. to Ida. and S.D. This range is given only tentatively, because of the current confusion between this and the following species. Cronquist [1947, p. 157] places *E. asper* in the synonymy of *E. glabellus* Nutt., but, in its erect stem and usually white ligules, it appears quite distinct. *E. asper* was also observed by the writer to flower in Manitoba at a much earlier date than *E. glabellus*. Both species as here treated include forms with stems appressed-pubescent and spreading-pubescent.

**10. E. glabellus** Nutt. (Incl. var. *pubescens* Hook.; *E. oligodontus* Lunnell)

Prairie, sandhills, and clearings in the southern half of the province. Northernmost collection: Rocky Lake, 30 miles north of The Pas, rich loam and clay on a high bank (Krivda, 1954). Earliest collection seen: near Fort Garry (Macoun, 1872). First report: (*E. glabellus*) "Quite common on the prairie from Winnipeg to the Rocky Mountains"; (var. *pubescens*) "Occasionally met with on the prairie west of Fort Ellice." [Macoun, 1884].

Subarctic western American: Alaska and Yukon near the Arctic Circle to Great Slave L. and south-central Man., s. to Mont., Colo., and Wisc. *See* note on range of the preceding species.

*E. compositus* Pursh var. *discoideus* Gray forma *trifidus* (Hook.) Fern. is cited from Churchill by Lowe [1943; as *E. trifidus* Hook.]. No specimens have been seen, however, and it should be excluded from our flora for the present.

## 13. ANTENNARIA Gaertn.

[*See* Fernald, 1945; Porsild, 1950.]

1. Basal leaves erect, 4-20 cm. long, strongly 3-nerved, the stem-leaves similar in outline but smaller; phyllaries with dark brown bases......................1. *A. pulcherrima*
1. Basal leaves spreading, forming depressed rosettes, strongly differing in outline from the more or less reduced stem-leaves.
    2. Rosette-leaves distinctly 3-5(-7)-nerved, up to 6 cm. long and 4(-5) cm. broad.
        3. Pistillate involucres 5-7 mm. high; corollas 2·5-4·3 mm. long; mature achenes 1-1·5 mm. long..................................2. *A. plantaginifolia*
        3. Pistillate involucres 8-10 mm. high; corollas 5·5-7 mm. long; mature achenes 1·5-1·8 mm. long.........................................3. *A. munda*
    2. Rosette-leaves smaller, with only the midrib prominent to the tip beneath.
        4. Middle and upper stem-leaves of pistillate plants terminated by a flat or merely inrolled scarious appendage.
            5. Leaves permanently white-tomentose on both surfaces (but more densely so beneath); flowering-stems 10-15 cm. high; stolons leafy throughout; plant of the far-northern regions......................................4. *A. isolepis*
            5. Leaves bright green and glabrous above, or only sparsely cobwebby.
                6. Pistillate heads loosely corymbed at maturity; leaves bright green above even in youth; flowering-stems 1-4·5 dm. high; stolons short, leafy, ascending, terminated by rosettes................................5. *A. canadensis*
                6. Pistillate heads subcapitate even in age; leaves white-tomentose above in youth, the margins often remaining so; flowering-stems 0·4-2 dm. high; stolons whip-like.............................................6. *A. campestris*
        4. Middle and upper leaves of pistillate stems blunt or subulate-tipped, only those about the corymb sometimes with flat scarious appendages.
            7. Stolons elongate and cord-like, only tardily developing terminal rosettes; leaves bright green above except in youth...........................7. *A. petaloidea*
            7. Stolons short and leafy, ending in depressed rosettes; leaves permanently more or less tomentose above.
                8. Inner phyllaries pink even in age; stolons freely branching; involucres 4-5 mm. high; plant of the Hudson Bay and low-northern regions..........8. *A. rosea*
                8. Inner phyllaries papery-white or straw-colour (those of *A. aprica* sometimes pinkish-tinged in youth).
                    9. Stem-leaves blunt; rosette-leaves rounded to an obscure point; involucre 8-10 mm. high, the heads erect even in youth.................9. *A. aprica*
                    9. Stem-leaves and rosette-leaves subulate-tipped.
                        10. Involucres 5-7 mm. high, the heads nodding in youth; rosette-leaves 0·5-1·5 cm. long, 2-5 mm. broad......................10. *A. parvifolia*
                        10. Involucres up to 9 mm. high, the heads erect; rosette-leaves 1-5·5 cm. long, 3-20 mm. broad.............................11. *A. neodioica*

1. **A. pulcherrima** (Hook.) Greene (Incl. var. *sordida* Boivin; *A. carpatica* (Wahl.) R. Br. var. *pulcherrima* Hook.; *A. eucosma* Fern. & Wieg.)

Specimens have been seen from the following localities: Moosehorn, about 90 miles north of Portage la Prairie, edge of woods (Scoggan, 1951); Gypsumville, about 100 miles north of Portage la Prairie, open jack-pine woods on limestone substratum (Scoggan, 1951); Duck Mountain, open woods (Rowe, 1950); Lake Winnipegosis, open black spruce woods south of Red Deer River (Scoggan & Baldwin, 1950); Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground (Scoggan, 1948); Hayes River, about 100 miles southeast of York Factory, clay-gravel beach (Scoggan, 1949); Gillam, about 165 miles south of Churchill, damp soil (Brooks, 1937; Schofield, 1950); Kettle Rapids, Nelson River, about 160 miles south of Churchill (Emerton, 1917); Limestone River near Gillam, sandy banks (Schofield, 1950); Hayes River, about 40 miles southeast of York Factory, clay-gravel beach (Scoggan, 1949); York Factory, cool boggy places (Bell, 1880); Deer River, about 35 miles south of Churchill, underbrush (Brown, 1950); Churchill, sandy areas (MacKinnon, 1947). First report: York Factory [Porsild, 1950, map 3, p. 8].

(Arctic-)subarctic American: n. Alaska and n. Yukon to n. Man., north-central Que., and Nfld., s. to Wash., Colo., s. Man., and Anticosti I., Que. A map of the Alaskan and Canadian distribution, on which additional Manitoba stations should be indicated, is given by Porsild [1950, map 3, p. 8].

2. **A. plantaginifolia** (L.) Hook. (*A. denikeana* Boivin)

Specimens appearing referable here have been seen from the following localities: Shoal Lake, near the Ontario boundary east of Winnipeg (Lowe, 1919; 1920); near Hazelridge, east of Winnipeg (Denike, 1939; type of *A. denikeana*); near Winnipeg, in sand (Denike, 1939). First report: Red River Prairie and Pembina Mountain [Dawson, 1875].

Temperate eastern American: se. Man. to Me., s. to Mo., Ala., and Ga.

3. **A. munda** Fern. (*A. obovata* Nels.)

Specimens appearing referable here have been seen from the following localities: Dufferin, near Carman, about 45 miles southwest of Winnipeg (Burgess, 1873); Indian Bay, Shoal Lake, near the Ontario boundary east of Winnipeg (Dudley, 1941); Lac du Bonnet, about 55 miles northeast of Winnipeg, dry sandy clearing (Scoggan, 1951). First report: Lowe [1943; based upon the inclusion of Manitoba in the range by Rydberg, 1932].

Temperate eastern American: se. Man. to Me., s. to Colo., S.D., Wisc., and Va.

4. **A. isolepis** Greene

Specimens have been seen from the following localities: Long Point, lat. 59° 21′ N., north of Churchill (Güssow, 1932); Nueltin Lake, lat. 59° 48′ N., gravelly shore (Baldwin, 1951). First report: Long Point [Malte, Rhodora 36: 108. 1934].

(Arctic-)subarctic American: n. Alaska to n. Que. and n. Lab., s. to n. B.C., n. Man., and north-central Que. A map of the distribution, on which the occurrence of the species in northern Manitoba should be indicated, is given by Porsild [1950, map 24, p. 20].

5. A. **canadensis Greene** (*A. neglecta* Greene var. *randii* (Fern.) Cronq.)

Dry, open places in the southern two-thirds of the province. Northernmost collection: Hayes River between Brassey Hill and The Rock, about 110 miles southeast of York Factory, rocky shore (Scoggan, 1949). Earliest collection seen: "L. Winipeg Valley" (Bourgeau, 1857). First report: Lowe [1943].

(Subarctic-)temperate eastern American: n. Man. to e. Que., s. to Minn., Ind., and Va.

6. A. **campestris** Rydb. (Incl. var. *athabascensis* (Greene) Boivin)

Prairie, rock outcrops, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: Stonewall, near Winnipeg, rocky fields (Macoun, 1896). First report: Stonewall [Greene, Pittonia 3: 275. 1898].

(Subarctic-)temperate western American: central B.C. to Great Slave L. and north-central Man., s. to Okla. and Mo. A map of the northern part of the distribution is given by Porsild [1950, map 1, p. 8]. This species is treated by Gleason [1952] under the synonymy of *A. neglecta* Greene.

7. A. **petaloidea** Fern.

Specimens appearing referable here have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg, dry pine woods (Breitung, 1949); Lac du Bonnet, about 50 miles northeast of Winnipeg, granite outcrops among jack-pines (Breitung, 1949); Riding Mountain, south-facing open shady slope, with various prairie species (Rowe, 1950). First report: the present publication.

Temperate eastern American: s. Man. to e. Que., s. to Wisc., Pa., and W. Va. This species is treated by Gleason [1952] under the synonymy of *A. neglecta* Greene.

8. A. **rosea** (D.C. Eat.) Greene

Specimens have been seen from the following localities: Norway House, off the northeast end of Lake Winnipeg, granite outcrop (Scoggan, 1949); Drunken Lake, north of Lake Winnipeg, granite shore (Scoggan, 1948); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, shore (Scoggan, 1949); Manistikwan Lake, near Flin Flon (Freedman, 1952); Oxford Lake, clearing (Scoggan, 1949); Gillam, about 165 miles south of Churchill (Schofield, 1950); Cochrane River, lat. 57° 58′ N., portage through black spruce woods (Baldwin, 1951). First report: York Factory [Bell, 1881; as *A. dioica* var. *rosea*]. Probable basis of the citation of *A. dioica* from between York Factory and Churchill by Bell [1884].

Subarctic American: sw. Alaska and central Yukon to n. Man., s. to Calif., Colo., S.D., central Man., and James Bay. A map of the Alaskan and Canadian distribution is given by Porsild [1950, map 30, p. 20].

9. **A. aprica** Greene (*A. parvifolia* Cronq., not Nutt.) [*See* Cronquist, Rhodora 48: 120. 1946; Boivin, Can. Field-Nat. 65: 12-13. 1951].

Prairie, rock outcrops, and clearings in the southern two-fifths of the province. Northernmost collection: Norway House, off the northeast end of Lake Winnipeg, granite outcrop (Scoggan, 1949). Earliest collection seen: Brandon, open prairie (Macoun, 1896). First report: Brandon [Greene, Pittonia 3: 282. 1898].

Temperate western American: B.C. to Man., s. to n. Mex., N.M., Neb., and w. Minn.

10. **A. parvifolia** Nutt. (*A. microphylla* Rydb.; *A. nitida* Greene) [*See* Boivin, Can. Field-Nat. 65: 12-13. 1951]

Dry prairie, sand ridges, rock outcrops, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: "Western plains, Man." (Macoun, 1872). First report: Jackson *et al.* [1922].

Subarctic American: central Alaska to Great Bear L. and n. Man., s. to N.M. and Neb. A map of the Alaskan and Canadian distribution is given by Porsild [1950, map 27, p. 20; *A. nitida*].

11. **A. neodioica** Greene (*A. neglecta* Greene var. *attenuata* (Fern.) Cronq.)

Specimens appearing referable here have been seen from the following localities: Melita, about 60 miles southwest of Brandon, sandy prairie (Scoggan, 1953); Carberry, about 25 miles east of Brandon, sandhills (Scoggan, 1953); Lac du Bonnet, about 50 miles northeast of Winnipeg, sandy and rocky jack-pine woods (Breitung, 1949); Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing in spruce woods (Scoggan, 1949); Fox Lake (presumably an enlargement of Fox River) (F. C. Bell, 1913); Gillam, about 165 miles south of Churchill, open area (Schofield, 1950). First reports: near Carberry [Shimek, 1927]; Spruce Woods Forest Reserve, southeast of Brandon [Bird, 1927].

(Subarctic-)temperate eastern American: n. Man. to Nfld., s. to Minn. and Va.

*A. alpina* (L.) Gaertn. is cited from York Factory by Jackson *et al.* [1922], and from York Factory and Churchill by Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora.

*A. sedoides* Greene is listed by Lowe [1943] on the basis of the inclusion of Manitoba in the range by Rydberg [1932]. It must be excluded from our flora until further study of this difficult genus is made in the province.

### 14. ANAPHALIS DC.

1. **A. margaritacea** (L.) C. B. Clarke Pearly Everlasting

Specimens have been seen from the following localities: Shoal Lake, near the Ontario boundary east of Winnipeg (Scott, 1920; Lowe, 1920); Lac du Bonnet, about 50 miles northeast of Winnipeg (Dudley, 1929; Breitung, 1949, clearing in sandy woods); Belair, near the south end of Lake Winnipeg (Marquardt, 1932); "Winnipeg River to Lake of the Woods"

(Richardson, undated, presumably 1819–22); Observation Point, east coast of Lake Winnipeg opposite Hecla Island, dry woods (Macoun, 1884); Bissett, about 110 miles northeast of Winnipeg (Moir, 1940). First report: Burman [1910]. Probable basis of the listing of *Gnaphalium obtusifolium* L. by Jackson *et al.* [1922] and Lowe [1943].

(Subarctic-)temperate American: s. Alaska to s. Lab. and Nfld., s. to Calif., Colo., S.D., and N.E.; e. Asia.

### 15. GNAPHALIUM L.

1. **G. uliginosum** L. Low Cudweed

A single specimen has been seen from Angusville, about 80 miles northwest of Brandon, where it was collected by W. G. Scott in 1923. First report: the present publication. Basis of the citation of *G. palustre* Nutt. from Angusville by Lowe [1943].

(Subarctic-)temperate circumpolar: B.C. to Nfld., s. to Oreg., Utah, Kans., and Va.; introd. in s. Alaska and central Yukon; s. Greenland; Iceland; n. Eurasia.

### 16. IVA L.

(Marsh-Elder)

1. Leaves sessile, linear-oblong to oblong or obovate, essentially entire; heads mostly solitary in the axils of the upper leaves; phyllaries about 5, united at base into a cup-shaped involucre....................1. *I. axillaris*

1. Leaves long-petioled, broadly ovate to rhombic, coarsely and irregularly toothed; heads racemose-paniculate; phyllaries nearly distinct, in 2 series of 5.........2. *I. xanthifolia*

1. **I. axillaris** Pursh Poverty-weed

Alkaline prairie and saline flats of southern Manitoba. Northernmost collection: Dauphin, north of Riding Mountain (Meakins, 1925). Earliest collection seen: Rapid City, about 20 miles north of Brandon, open saline prairie (Macoun, 1896). First report: Burman [1910].

Temperate western American: B.C. to s. Man., s. to Calif. and Okla.

2. **I. xanthifolia** Nutt. (*Cyclachaena xanthifolia* (Nutt.) Fresen.)

Roadsides and waste places in the southern part of the province. Northernmost collection: Dauphin, north of Riding Mountain, thicket by Vermilion River (Scoggan, 1951). Earliest collection seen: Winnipeg (Fletcher, 1895). First report: Burman [1910].

Temperate western American: Alta. to Man., s. to N.M., Tex., Okla., and Mo.; adventive farther eastward.

### 17. AMBROSIA L.

(Ragweed)

1. Leaves pinnately 3-5-lobed or undivided, opposite; staminate involucres 3-ribbed on the outer side; receptacle naked....................1. *A. trifida*

1. Leaves pinnately lobed; staminate involucres indistinctly radiate-veined; receptacle chaffy.

2. Staminate involucres glabrous or pilose; fruits with usually 4-7 sharp tubercles encircling the base of the subulate (1-2 mm. long) beak; leaves smoothish above, relatively thin, 2-3-pinnatifid; plant annual..............2. *A. artemisiifolia* var. *elatior*

2. Staminate involucres strigose-hispid; fruits nearly beakless, unarmed or with about 4 short blunt tubercles; leaves scabrous above and somewhat hoary, thickish, once pinnatifid; perennial from a creeping rhizome.....3. *A. psilostachya* var. *coronopifolia*

1. **A. trifida** L. Great Ragweed. Buffalo-weed

Roadsides and waste places in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). Earliest collection seen: Brandon, bank of Assiniboine River (Macoun, 1896). First report: Burman [1910]. Probable basis of the citation of *A. "trifolia"* from Winnipeg by Bourgeau [in Palliser, 1863].

Temperate American: B.C. to sw. Que., s. to Ariz. and Fla.; adventive in Europe.

Forma *integrifolia* (Muhl.) Fern., with unlobed leaves, is of common occurrence in the province with the main form.

2. **A. artemisiifolia** L. var. **elatior** (L.) Descourtils (*A. elatior* L.) Common Ragweed

Roadsides and waste places in the southern third of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, limestone shingle shore of Salt Point (Scoggan, 1948). Earliest collection seen: Winnipeg (Burman, 1897). First report: Jackson *et al.* [1922]. Basis of reports of the main form from the province.

Temperate American: southern Canada, s. to Mex. and Fla.

Var. *elatior* forma *villosa* Fern. & Grisc., with spreading-villose pubescence, has been collected at Oak Bluff, Morris, and Steeprock.

3. **A. psilostachya** DC. var. **coronopifolia** (T. & G.) Farw. (*A. coronopifolia* T. & G.) Perennial Ragweed

Prairie, roadsides, and waste ground of southern Manitoba. Northernmost collection: Dauphin, north of Riding Mountain (Conner, undated). Earliest collection seen: "West of Manitoba" (presumably the western part of the province) (Macoun, 1872). First report: Lowe [1943]. Basis of reports of the main form from the province. Probable basis of the citation of *Franseria acanthicarpa* (Hook.) Cov. (*Gaertneria acanthicarpa*; *Ambrosia acanthicarpa*) from Red River by Hooker [1834], Jackson *et al.* [1922], and Lowe [1943].

Temperate western American: Mont. to Sask. and Man., s. to Mex., Tex., and La.; adventive further eastward, and in Europe.

### 18. XANTHIUM L.

1. **X. strumarium** L.

Roadsides and waste places of southern Manitoba. According to Cronquist [Rhodora 47: 402. 1945], "The determination of species of *Xanthium* has become a formidable task, undertaken by many botanists only when it becomes unavoidable, and then with serious misgivings." The present writer is no exception, and is of the opinion that many more collections of the genus must be made in the province before a separation into more than one species can be attempted with any degree of confidence. The seventeen collections examined lend weight to the statement of Wiegand [Flora of the Cayuga Lake Basin, p. 414, footnote] that "I am now greatly in doubt as to the existence of more than one real species in the group represented by *X. chinense* Mill., *X. pennsylvanicum* Wallr., *X. italicum* Mor., and other related forms. The foliage in these forms is practically identical, and the only differences of any moment are in the burs, which are indeed highly variable. Extreme forms of burs, however, are often found in the same colony, as though sporadically produced. A large suite of specimens is almost sure to show a nearly or quite unbroken series through the various forms. In every attempt to segregate the burs into species, so many transitional specimens have been found as to do unwarranted violence to any species concept." In addition to the aforementioned "species", the writer includes here reports of *X. canadense* Mill., *X. commune* Britt., *X. glanduliferum* Greene, and *X. macounii* Britt. from the province. Northernmost collection seen: Dauphin, north of Riding Mountain (unknown collector, 1924). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Fort Garry [Schultz, 1861].

Temperate American: B.C. to Que., s. to Calif., Mex., and Fla.; S. Am.; introd. in Europe.

### 19. HELIOPSIS Pers.

### (Ox-eye)

1. **H. helianthoides** (L.) Sweet var. **scabra** (Dunal) Fern. (*H. scabra* Dunal)

Dry thickets and roadsides of southern Manitoba. Northernmost collection: Birtle, about 60 miles northwest of Brandon (Dudley, 1941). Earliest collection seen: Portage la Prairie, dry prairie (Macoun, 1872). First report: Common on the banks of the Red River, near the "Forks" [Hooker, 1834; according to Macoun, 1884, this is at the junction of the Red and Assiniboine rivers at Winnipeg].

Temperate American: B.C. to Que., s. to N.M., Tenn., and Md.

### 20. RUDBECKIA L.

### (Coneflower)

1. Leaves entire or nearly so; plant hirsute or hispid throughout............1. *R. serotina*
1. Leaves, at least the middle and lower ones, deeply cleft; plant glabrous or the leaves minutely pubescent above..............................................2. *R. laciniata*

1. **R. serotina** Nutt. (R. *hirta* of auth., not L.) [*See* Fernald, Rhodora 50: 172-176. 1948.] Black-eyed Susan

Dry prairie, roadsides, and clearings in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, portage through forest (Scoggan, 1948). Earliest collection seen: Portage la Prairie, dry prairie (Macoun, 1872). First report: the present publication. Basis of reports of *R. hirta* from the province, and the citation of *R. fulgida* Ait. from Dufferin by Dawson [1875].

Temperate western American: B.C. to Man., s. to Colo. and Tex.; adventive farther eastward. This range is given only tentatively, because of uncertainty as to the limits of the native range, and the present confusion between *R. serotina* and *R. hirta*.

2. **R. laciniata** L.

Thickets and low ground in the southern part of the province. Northernmost collection: Dauphin, north of Riding Mountain, thicket by Vermilion River (Scoggan, 1951). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Red River [Hooker, 1834]. Probable basis of the listing of *Ratibida pinnata* (Vent.) Barnh. (*Lepachys pinnata* (Vent.) T. & G.) by Jackson *et al.* [1922] and Lowe [1943].

Temperate American: Mont. and Man. to w. Que., s. to Ariz., Tex., and Fla.

### 21. ECHINACEA Moench

### (Purple Coneflower)

1. **E. angustifolia** DC. (*Brauneria angustifolia* (DC.) Heller)

Dry prairie in the southern part of the province. Northernmost collection: Winnipeg (Marquardt, undated). Earliest collection seen: Brandon, open prairie (Macoun, 1884). First report: near Brandon [Christy, 1887].

Temperate western American: Sask. and Man., s. to Tex.

### 22. RATIBIDA Raf.

### (Prairie-Coneflower)

1. **R. columnifera** (Nutt.) Wooton & Standl. (*Rudbeckia columnaris* Pursh; *Lepachys columnaris* (Pursh) T. & G.; *Ratibida columnaris* (Pursh) D. Don)

Dry prairie of southern Manitoba. Northernmost collection: Millwood, about 85 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Fort Garry (Schultz, 1861). First report: Red River [Hooker, 1834].

Temperate western American: Alta. to Man., s. to Mex., Tex., and Ill.

Forma *pulcherrima* (DC.) Fern., with ligules in part or wholly brownish purple, has been collected at Brandon (Macoun, 1896; Stevenson, 1950).

### 23. HELIANTHUS L.

### (Sunflower)

1. Phyllaries tightly appressed in several distinct series, abruptly narrowed to the obtuse or acute (but not acuminate) apex; disk-corollas with dark purple lobes; leaves opposite.
    2. Leaves oblong-lanceolate to lance-ovate, at 7-15 nodes.................................................................................3. *H. laetiflorus* var. *rigidus*
    2. Leaves subrhombic-lanceolate to subrhombic-ovate, at 6-9 nodes...................................................................3a. *H. laetiflorus* var. *subrhomboideus*

1. Phyllaries looser and less distinctly seriate, acuminate or long-attenuate at apex.

3. Leaves mostly alternate; receptacle nearly flat; disk-corollas mostly with dark purple lobes; annual plants with fibrous roots.

4. Leaves dentate; achenes whitish or greyish, glabrous except for the sparsely hairy summit; phyllaries long-ciliate....................................1. *H. annuus*

4. Leaves entire or somewhat undulate-dentate; achenes brownish, villous-pubescent at least when young; phyllaries eciliate or short-ciliate............2. *H. petiolaris*

3. Leaves often opposite; receptacle convex or low-conical; disk-corollas with yellow lobes; perennial plants with rhizomes or tuberous-thickened roots.

5. Leaves sessile or subsessile, alternate (or the lower ones opposite), only the midrib prominent above base.

6. Leaves lanceolate, often longitudinally folded and falcate-recurving, strongly scabrous on both sides; disk 2-3 cm. broad; ligules 2·5-4 cm. long, golden-yellow ..............................................4. *H. maximiliani*

6. Leaves lanceolate to lance-oblong, flat, strongly scabrous above, less so beneath; disk about 2 cm. broad; ligules 1·5-2 cm. long, pale yellow.......5. *H. giganteus*

5. Leaves distinctly petioled, mostly opposite, triple-nerved, ovate or ovate-oblong, their petioles broadly winged above the middle; rhizomes freely tuberiferous........ ..........................................6. *H. tuberosus* var. *subcanescens*

1. **H. annuus** L. (*H. lenticularis* Dougl.) Common Sunflower

Roadsides and waste places in the southern part of the province. Northernmost collection: Stony Mountain, north of Winnipeg (Simpson, 1941). Earliest collection seen: Napinka, about 55 miles southwest of Brandon, railway embankment (Macoun, 1896). First report: Burman [1910].

Temperate western American: Wash. to Man., s. to Calif., Tex., and Minn.; extensively cultivated and escaping in its native range and eastward to Que. and the Atlantic States.

2. **H. petiolaris** Nutt. (*H. aridus* Rydb.)

Specimens have been seen from the following localities: Glenboro, about 35 miles southeast of Brandon, sandhills (Dore & Breitung, 1950; Scoggan, 1951); Aweme, about 20 miles southeast of Brandon, sandhills (Fletcher, 1905). First report: Jackson *et al.* [1922].

Temperate western American: B.C. to Man., s. to Ariz., N.M., Tex., and La.; adventive farther eastward.

3. **H. laetiflorus** Pers. var. **rigidus** (Cass.) Fern. (*H. rigidus* (Cass.) Desf.; *H. scaberrimus* Ell.)

Prairie and thickets in the southern half of the province. Northernmost collection: The Pas, sandy area (Krivda, 1953). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: Turtle Mountain and "Rising ground east of Red River valley" [Dawson, 1875].

Temperate American: B.C. to w. Ont., s. to Tex. and Ga.; adventive farther northeastward.

3a. **H. laetiflorus** var. **subrhomboideus** (Rydb.) Fern. (*H. subrhomboideus* Rydb.)

Similar habitats in the southern part of the province. Northernmost collection: Bield, south of Duck Mountain, isolated prairie hills (Scoggan, 1951). Earliest collection seen: Brandon, damp spots on prairie (Macoun, 1896). First report: Jackson *et al.* [1922].

Temperate western American: Alta. to Man., s. to N.M., Ark., and Ill.; adventive further westward and at Dawson, Yukon Territory.

4. **H. maximiliani** Schrad.

Prairie and thickets in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). Earliest collection seen: Turtle Mountain, open prairie (Burgess, 1873). First report: Burman [1910]. Basis of the citation of *H. nuttallii* T. & G. from Turtle Mountain by Macoun [1884], and probable basis of the citation of *H. fascicularis* Greene (*H. utahensis* Nels.; *H. giganteus* var. *utahensis* D. C. Eat.) from Turtle Mountain by Lowe [1943].

Temperate western American: Sask. and Man., s. to Tex., Okla., and Mo.; adventive further eastward.

5. **H. giganteus** L.

Thickets and clearings in the southern quarter of the province. Northernmost collection: Benito, north of Duck Mountain, clay road embankment (Scoggan, 1951). Earliest collection seen: Lake Winnipeg (Richardson, presumably 1819–22; the earliest dated collection seen is one from Fort Garry made by Macoun in 1872). First report: Red River [Hooker, 1834]. Probable basis of the citation of *H. grosseserratus* Mart. from near Macgregor by Shimek [1927].

Temperate American: Alta. to sw. Que., s. to Colo. and Fla.

6. **H. tuberosus** L. var. **subcanescens** Gray (*H. subcanescens* Gray) Jerusalem Artichoke

Thickets and low ground in the southern part of the province. Northernmost collection: Dauphin, north of Riding Mountain, thicket by Vermilion River (Scoggan, 1951). Earliest collection seen: Winnipeg, along Red River (Macoun, 1896). First report: banks of the Red River [Jackson *et al.*, 1922]. Probable basis of the listing of *H. doronicoides* Lam. by Jackson *et al.* [1922] and Lowe [1943], and the citations of *H. strumosus* L. from Turtle Mountain by Macoun [1884] and from near Carberry by Christy [1887].

Temperate eastern American: Man. to O., s. to Kans. and Mo.

*H. divaricatus* L. is cited from Norway House by Hooker [1834] and Macoun [1884], is listed by Jackson *et al.* [1922] and Lowe [1943], and accredited to Manitoba in the range given by Gleason [1952]. No specimens have been seen, however, and it is probable that some of the reports are referable to *Heliopsis helianthoides* var. *scabra.* It should be excluded from our flora for the present.

## 24. Coreopsis L.

1. Leaves (except the uppermost) 1-2-pinnatifid; achenes wingless; plant annual........................................................................1. *C. tinctoria*
1. Leaves deeply trilobed, the lobes entire; achenes narrowly winged; perennial from a creeping rhizome..................................................................*C. palmata*

**1. C. tinctoria** Nutt.

A single specimen has been seen, from Deloraine, near the northwest edge of Turtle Mountain, where it was collected along a sandy prairie roadside by the writer in 1951. First report: "Near southern boundary" [Lowe, 1943].

Temperate western American: Wash. to s. Sask. and s. Man., s. to Calif., Tex., and La.

*C. palmata* Nutt. is reported from Winnipeg by Macoun [1886], is listed by Jackson *et al.* [1922] and Lowe [1943], and ascribed to Manitoba in the range given by Fernald [1950] and Gleason [1952]. No specimens have been seen, however, and it is possible that all reports are based upon the dubious citation of *C. delphinifolia* Lam. from "Winipeg" by Bourgeau [in Palliser, 1863].

### 25. Bidens L.

### (Bur-Marigold)

1. Leaves simple; ligules often present.
  2. Leaves sessile and often somewhat united around the stem at base; achenes convex at summit.........................1. *B. cernua*
  2. Leaves petioled; achenes truncate at summit.........................*B. connata*
1. Leaves pinnate with 3-5 mostly distinct leaflets; ligules wanting or rudimentary.
  3. Outer (chiefly foliaceous) involucral bracts 5-8, sparingly ciliate; disk-corollas orange; achenes blackish.........................2. *B. frondosa*
  3. Outer involucral bracts 10-20, copiously hispid-ciliate; disk-corollas pale yellow; achenes olive to pale brown.........................3. *B. vulgata*

**1. B. cernua** L. (Incl. var. *dentata* (Nutt.) Boivin and var. *minima* (Huds.) Pursh; *B. glaucescens* Greene; *B. leptopoda* Greene) Stick-tight

Damp to wet ground and shores in the southern half of the province. Northernmost collection: Wabowden, about 135 miles northeast of The Pas, wet soil (Dadisman & Core, 1948). Earliest collection seen: Winnipeg River (Richardson, undated, but presumably 1819-22; the earliest dated collection seen is one made on Muskeg Island, Lake Winnipeg, by Macoun in 1884). First report: Brandon [Greene, Pittonia 4: 261. 1901; as *B. leptopoda*]. Probable basis of reports of *B. connata* Muhl. from the province by Burman [1910], Jackson *et al.* [1922], and Lowe [1943], and of the citation of *B. laevis* (L.) BSP. from Spruce Woods Forest Reserve by Bird [1927].

Temperate circumpolar: B.C. to e. Que., s. to Calif., Ida., S.D., Mo., and N.C.; Eurasia.

**2. B. frondosa** L. Beggar-ticks

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg, ditches (Macoun, 1896); Winnipeg and vicinity (Malte, 1917; Sparling, 1950; Quelch, 1950); Selkirk, borders of marshes (Macoun, 1884); Brokenhead, about 30 miles northeast of Winnipeg (Mosquin, 1952); Aweme, about 20 miles southeast of Brandon (Criddle, 1926); Grand Rapids, off the northwest end of Lake Winnipeg, moist ground and trails (Scoggan, 1948); The Pas, wet ditch (Krivda, 1950). First report: Burman [1910].

(Subarctic-)temperate American: Wash. and ?Alta. to Nfld., s. to Calif., La., and Va.; introd. in Europe.

3. **B. vulgata** Greene

Specimens (all referable to forma *puberula* (Wieg.) Fern., with involucral bracts and leaves densely villous-puberulent) have been seen from the following localities: Morris, about 35 miles south of Winnipeg, railway yard, cinders (Scoggan, 1953); Winnipeg, damp ditch (Scoggan, 1951); St. Leon, about 40 miles south-southwest of Portage la Prairie, edge of swamp (de Ruyck, 1943); Alexander, about 20 miles west of Brandon (Thomas, 1938); Delta, at the south end of Lake Manitoba, salt marsh (A. & D. Löve, 1951). First report: Jackson *et al.* [1922].

Temperate American: Alta. to N.S., s. to Calif., Wyo., Kans., and N.C.

### 26. MEGALODONTA Greene

(Water-Marigold)

1. **M. beckii** (Torr.) Greene (*Bidens beckii* Torr.)

Shallow water in the southern two-fifths of the province. Specimens have been seen from the following localities: Reed River, about 95 miles southeast of Winnipeg, in water (Dawson, 1873); lakes near the Ontario boundary east of Winnipeg (Lowe, 1920, 1940; Simpson, 1940); Grand Rapids, near the northwest end of Lake Winnipeg, shallow water (Scoggan, 1948). First report: Lake of the Woods (Reed River emptying into this body of water) [Dawson, 1875].

Temperate American: Wash. and Oreg.; Sask. to N.S., s. to Mo. and Pa.

### 27. GALINSOGA R. & P.

1. **G. ciliata** (Raf.) Blake

Specimens have been seen from the following localities: Winnipeg (Batho, 1940; Lowe, 1943, gardens; Denike, 1944); Grand Beach, near the southeast end of Lake Winnipeg (no data); Edwin, about 10 miles south of Portage la Prairie (no data); Boissevain, north of Turtle Mountain (Lee, 1948). First report: Grand Beach and Winnipeg [Lowe, 1943].

Tropical American: widely naturalized in temperate North America.

### 28. MADIA Molina

(Tarweed)

1. **M. glomerata** Hook.

A single specimen has been seen, from Portage la Prairie, where it was collected by Willing (year uncertain). First report: Portage la Prairie [Groh, 1944].

Temperate western American: B.C. to s. Man., s. to Calif. and N.M.; sparingly adventive eastward.

## 29. HELENIUM L.

## (Sneezeweed)

1. **H. autumnale** L. var. **montanum** (Nutt.) Fern. (*H. montanum* Nutt.; incl. *H. macranthum* Rydb.)

Thickets, meadows, and shores in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing in white spruce woods (Scoggan, 1949). Earliest collection seen: High Bluff, near Portage la Prairie (Hargrave, 1883). First report: Lowe [1943; *H. macranthum*].

Temperate western American: B.C. to Man., s. to N.M. and Kans.; the typical form from Minn. to N.E.

## 30. GAILLARDIA Foug.

1. **G. aristata** Pursh (*G. bicolor* Pursh)

Prairie and clearings in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, dry limestone-gravel ridge (Scoggan, 1948). Earliest collection seen: Pembina Mountain, south of Portage la Prairie, open prairie (Burgess, 1873). First report: "Lake Winipeg to the Saskatchewan and the Rocky Mountains" [Hooker, 1834; *G. bicolor*]. Basis of the citation of *G. pinnatifida* Torr. from Red River and Pembina Mountain by Dawson [1875].

Temperate western American: B.C. to Man., s. to N.M. and Ariz.; sparingly adventive or escaped from cultivation eastward.

## 31. ACHILLEA L.

## (Yarrow)

[*See* N. Am. Fl. 34: 219-227. 1916; Boivin, 1951.]

1. Leaves deeply toothed or incised but not bipinnately dissected; ligules about 1 mm. long; involucre bell-shaped, about as broad as long..........................1. *A. sibirica*
1. Leaves bipinnately dissected; ligules 1·5-4 mm. long; involucre cylindric.
   2. Phyllaries with dark brown to blackish margins; ligules 3-4 mm. long; plant of the Hudson Bay and low-northern regions..........................2. *A. borealis*
   2. Phyllaries pale, only the outermost rarely dark-margined; ligules 1-2·5 mm. long.
      3. Corymb flattish-topped, up to 3 dm. broad; stem cobwebby to smoothish..........................3. *A. millefolium*
      3. Corymb strongly convex, 2-10 cm. broad; stem heavily woolly..........................4. *A. lanulosa*

1. **A. sibirica** Ledeb. (*A. multiflora* Hook.)

Thickets and shores in the southern half of the province. Northernmost collection: Knee Lake, rocky island (Scoggan, 1949). Earliest collection seen: "River Winipeg and Rainy Lake" (therefore uncertain whether collected in Manitoba or Ontario) (Richardson, undated, presumably 1819-22; the earliest dated collection seen was made at Washow Bay, Lake

Winnipeg, by Macoun, in 1884). First report: "In all river valleys from Lake Manitoba to the Rocky Mountains and northward to Lake Athabasca" [Macoun, 1884].

Subarctic American: north-central Alaska and nw. Mack. to n. Man., s. to s. Alta. and N.D.; e. Que.; e. Asia.

2. **A. borealis** Bong. (Incl. *A. nigrescens* (Mey.) Rydb. (*A. millefolium* subsp. *atrotegula* Boivin))

Sandy or rocky open ground and shores in the northern half of the province. Northernmost collection: Churchill (several collections, the first by McTavish in 1853). Southernmost collection: Norway House, near the northeast end of Lake Winnipeg, granite outcrops (Scoggan, 1948). Earliest collection seen: the foregoing McTavish specimen from Churchill. First report: Churchill [Tyrrell, 1897; *A. millefolium* var. *nigrescens* Mey.]. Probable basis of the listing of *A. subalpina* by Lowe [1943].

(Arctic-)subarctic circumpolar: n. Alaska and n. coast of Yukon and Mack. to n. Man., n. Que., central Lab., and Nfld., s. to Calif., N.M., James Bay, n. Mich., and N.H.; n. Eurasia.

3. A. MILLEFOLIUM L. Common Yarrow. Milfoil

Fields and roadsides throughout the province except the extreme north. Northernmost collection: Churchill, waste ground (Dore, 1949). Earliest collection seen: Grant's Point, Pembina River, open prairie (Burgess, 1873). First report: between York Factory and Churchill [Rae, 1850].

Eurasian: widely naturalized in North America.

Forma *rosea* Rand & Redf., with pink to rose-purple ligules, has been collected on Riding Mountain and at Warren Landing and The Pas.

4. **A. lanulosa** Nutt. (*A. millefolium* L. subsp. *pallidotegula* Boivin, incl. var. *russeolata* Boivin)

Prairie, rock outcrops, shores, and clearings throughout the province except the extreme north. Northernmost collection: Churchill (Porsild, 1930). Earliest collection seen: Brandon, open prairie (Macoun, 1896). First report: Jackson *et al.* [1922].

Subarctic American: n. Alaska to n. Man., central Que., and Nfld., s. to Mex., Okla., Mo., Mich., and N.S.

### 32. ANTHEMIS L.

1. Ligules white; plant glabrous or sparsely pubescent above................1. *A. cotula*
1. Ligules yellow; plant copiously pubescent..............................*A. tinctoria*

1. A. COTULA L. (*Maruta cotula* (L.) DC.) Mayweed

Specimens have been seen from the following localities: Winnipeg (Mawson, 1918); Fort Garry (Thomas, 1933, campus); Killarney, northeast of Turtle Mountain, by a grain elevator (Macoun, 1896); The Pas (Krivda, 1949, garden escape). First report: Burman [1910]. The citations from

Winkler, Morden, and Riding Mountain by Lowe [1943] and from Morden, Stony Mountain, and Brandon by Groh & Frankton [1948] are referable to *Matricaria chamomilla*.

European: widely naturalized in North America.

*A. tinctoria* L., Yellow Chamomile, is represented in the herbarium of the University of Manitoba by a sheet bearing the following data: "Winnipeg, campus, July". It was probably a mere waif. The species can scarcely be considered a naturalized element of our flora.

## 33. MATRICARIA L.

## (Wild Chamomile)

1. Ligules none; disk-corollas 4-lobed; plant pineapple-scented.........1. *M. matricarioides*
1. Ligules present, white; disk-corollas 5-lobed.
  2. Receptacle conical; achenes oblong, faintly ribbed; pappus none; plant pineapple-scented.......................................................2. *M. chamomilla*
  2. Receptacle hemispherical; achenes obpyramidal, strongly ribbed, tipped by a short crown-like pappus; plants odourless.
    3. Phyllaries green; plant tall and much branched........3. *M. maritima* var. *agrestis*
    3. Phyllaries dark brown or black; low, nearly simple, plant of the Hudson Bay region.........................................................4. *M. ambigua*

1. **M. matricarioides** (Less.) Porter (*M. suaveolens* (Pursh) Buch., not L.; *Chamomilla suaveolens* (Pursh) Rydb.) Pineapple-weed

Waste ground and clearings throughout the province except the extreme north. Northernmost collection: Brochet, Reindeer Lake, sandy terrace around settlement (Baldwin, 1951). Earliest collection seen: Morden, about 50 miles southwest of Winnipeg (Groh, 1922). First report: Lowe [1943].

Temperate western American: "Uncertain where native, introduced and partly naturalized throughout Eurasia and N. America" [Hultén, 1950].

2. M. CHAMOMILLA L.

Specimens have been seen from the following localities: Reynolds, about 50 miles east of Winnipeg (Jackson, 1923); Dufrost, about 30 miles south of Winnipeg, farmland (Pankiw, 1953); Morden, about 60 miles southwest of Winnipeg (Groh, 1932, fields and waste places; Marshall, 1940, vacant lot); Winkler, about 60 miles southwest of Winnipeg (Marquardt, 1931); Stony Mountain, near Winnipeg, fields and waste places (Groh, 1922); Brokenhead, about 30 miles northeast of Winnipeg (Mosquin, 1952); Brandon, railway gravel (Groh, 1945); The Pas, common on paths (Krivda, 1949). First report: the present publication.

Eurasian: widely naturalized in North America.

3. M. MARITIMA L. var. AGRESTIS (Knaf) Wilmott. (*M. inodora* L.; *Chamomilla inodora* (L.) Gilib.)

Specimens have been seen from the following localities: Brokenhead, about 30 miles northeast of Winnipeg, roadside (Scoggan & Mosquin, 1953); Brandon (Stevenson, 1953); Erickson, about 45 miles north of Brandon, road embankment (Scoggan, 1951); Rackham, about 45 miles north of

Brandon, field (Scoggan, 1953); Sandy Lake, about 45 miles north of Brandon, waste ground (Scoggan, 1951); Oakburn, about 55 miles northwest of Brandon, roadside (Scoggan, 1953); Ethelbert, east of Duck Mountain, roadside (Scoggan, 1953). First report: York Factory [Hooker, 1834; as *Pyrethrum inodorum* Sm.]. This northern citation, however, is undoubtedly referable to the following species.

European: naturalized in eastern North America.

4. **M. ambigua** (Ledeb.) Krylof (*M. inodora* L. var. *nana* (Hook.) T. & G. and var. *grandiflora* (Hook.) Ostenfeld)

Specimens have been seen from the following localities: York Factory, "arctic shores" (Bell, 1880); Churchill (several collections, the earliest seen having been made by Macoun in 1910). First report: Churchill [Tyrrell, 1897]. Basis of the citations of *Matricaria inodora, Pyrethrum inodorum,* and *Chamomilla inodora* from York Factory by Jackson *et al.* [1922], Hooker [1834], and Lowe [1943], respectively.

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to n. Banks I.), to n. Que., s. to central Alaska, n. Man., and James Bay; southern half of Greenland; n. Eurasia.

### 34. CHRYSANTHEMUM L.

1. Phyllaries up to 10 mm. long and 3 mm. broad; lower leaves cuneate-spatulate, crenate or cleft at apex, somewhat fleshy; plant of the Hudson Bay coast........1. *C. arcticum*

1. Phyllaries smaller; lower leaves spatulate-obovate, coarsely dentate, incised or pinnatifid, on slender petioles, scarcely fleshy..........2. *C. leucanthemum* var. *pinnatifidum*

1. **C. arcticum** L.

Specimens have been seen from the following localities: York Factory, clay flats of Marsh (Beacon) Point (Scoggan, 1949); west coast of Hudson Bay, lat. 58° N., gravelly shores (Macoun, 1886); Churchill River, "arctic shores" (Bell, 1879); Churchill (several collections, the earliest seen having been made by Macoun in 1910). First report: York Factory [Hooker, 1834].

(Arctic-)subarctic circumpolar (incl. ssp. *polaris* Hult.): n. coast of Alaska, Yukon, and Mack. to central Keewatin and n. Que., s. along the coasts to Queen Charlotte I. and s. James Bay; n. Eurasia (large gaps). A map of the distribution is given by Hultén [Svensk Botanisk Tidskrift 43: 404 (fig. 10). 1949].

2. C. LEUCANTHEMUM L. var. PINNATIFIDUM Lecoq & Lamotte Ox-eye-Daisy

Specimens have been seen from the following localities: Lorette, about 10 miles southeast of Winnipeg, roadside (Groh, 1934); Whiteshell Forest Reserve, east of Winnipeg (Frankton & Bibbey, 1947, roadside; Scoggan, 1951, dry sandy clearing); Winnipeg and vicinity (Groh, 1921, 1945; Marquardt, 1931); Winnipeg Beach, about 35 miles north of Winnipeg (Lowe, 1908); Norway House, near the northeast end of Lake Winnipeg, clearing (Scoggan, 1948); Carman, about 45 miles southwest of Winnipeg (Groh, 1932); Crystal City, about 65 miles southeast of Brandon (Thomas, 1938); Brandon, grassy roadside (Dore & Lindsay, 1950; Scoggan, 1953); Camperville, near the northeast edge of Duck Mountain, gravelly clearing (Scoggan, 1951); The Pas (Krivda, 1949). First report: Winnipeg, Lorette, Carman, and Churchill [Groh, 1946].

Eurasian: widely naturalized in North America.

### 35. TANACETUM L.

### (Tansy)

1. Heads numerous in a flat-topped corymb, the disk 0·5-1 cm. broad; leaves bipinnatifid; plant erect, essentially glabrous........................................1. *T. vulgare*

1. Heads mostly 1-6, loosely disposed, the disk up to 2 cm. broad; leaves tripinnatifid; depressed, villous-pubescent plant of the Hudson Bay and low-northern regions........................................................2. *T. huronense*

1. T. VULGARE L. Common Tansy. Golden-buttons

Roadsides and clearings of southern Manitoba. Northernmost collection: Swan River, north of Duck Mountain, roadside (Scoggan, 1951). Earliest collection seen: banks of the Assiniboine River (Mawson, 1918). First report: Jackson *et al.* [1922].

Eurasian: widely naturalized in North America.

2. **T. huronense** Nutt.

Specimens have been seen from the following localities: Hayes River opposite the mouth of Fox River, about 80 miles southwest of York Factory, clay-gravel beach (Scoggan, 1949); Hayes River about 40 miles southwest of York Factory, clay-gravel floodplain of small island (Scoggan, 1949); Nelson River, gravel beach opposite Gillam Island, about 20 miles west-southwest of York Factory (Scoggan, 1949); Nelson River about 30 miles west-southwest of York Factory, gravel beach (Scoggan, 1949); York Factory, cobble floodplain of island (Scoggan, 1949). First report: Hayes River [Bell, 1881]. Basis of the citation of *Omalanthus camphoratus* Less. (*Tanacetum camphoratum* Less.) from York Factory by Hooker [1834]. The Manitoba material may be referable to the scarcely distinct var. *bifarium* Fern.

(Arctic-)subarctic American (the inclusive species): n. Alaska to nw. Sask., n. Man., n. Que., and Nfld., s. to s. B.C., n. shore of L. Sup., and Me. Closely related to *T. bipinnatum* L. of Alaska and Eurasia; *see* discussion in Hultén [1950, pp. 1551–1552].

### 36. ARTEMISIA L.

### (Wormwood)

[*See* N. Am. Fl. 34: 244-285. 1916; Hall and Clements, 1923; Keck, 1946.]

1. Receptacle beset with long woolly hairs; leaves silvery-silky.

  2. Ultimate segments of the 2-3-pinnatifid leaves 1·5-4 mm. broad; stems coarse, herbaceous, erect, 5-15 dm. high........................................1. *A. absinthium*

2. Ultimate segments of the twice ternate leaves linear-filiform, 0·5-1 mm. broad; stems slender, often decumbent, from a branching woody base, 2-5 dm. high.................................................................. 2. *A. frigida*

1. Receptacle naked.

3. Leaves entire or rather shallowly toothed or lobed, or the lower ones sometimes deeply 3-cleft near apex.

4. Stem and branches woody, the latter strongly ascending; leaves linear or linear-lanceolate, acute, 2-5 cm. long, 2-4 mm. broad, silky-canescent or sometimes glabrate in age; marginal pistillate flowers wanting.................... 3. *A. cana*

4. Stem and branches herbaceous, or the former sometimes somewhat woody at base; marginal pistillate flowers present.

5. Involucres subglobose, 2 mm. high, 2-3 mm. broad; central florets sterile, their styles undivided; leaves linear, 3-8 cm. long, 1-3(-4) cm. broad, green and glabrous or more often silky-canescent, the basal ones often deeply 3-cleft; stem and branches glabrous or more or less greyish-pubescent............... 4. *A. glauca*

5. Involucres somewhat bell-shaped, longer than broad, 3-5 mm. high; central florets fertile, their styles 2-cleft; leaves linear to lanceolate or oblanceolate, white-tomentose, especially beneath; stem and branches whitened with a close felt-like pubescence.

6. Involucres 4-5 mm. high, 3-4 mm. broad; leaves linear-attenuate, entire or the lowest rarely toothed, revolute-margined; stems clustered from stout woody crowns up to 2 cm. thick, without stolons................. 10. *A. longifolia*

6. Involucres 3-4 mm. high, 2-3 mm. broad; leaves entire or few-toothed or lobed above the middle, flat-margined; stems scattered or few together from slender cord-like rhizomes, soon producing slender elongate stolons.

7. Leaves flat, mostly straight, ascending or spreading.

8. Leaves lanceolate, acute or attenuate, ascending; stems often simple except for short axillary branches..... 12. *A. ludoviciana* var. *gnaphalodes*

8. Leaves oblong to oblong-oblanceolate, blunt or merely acutish, loosely ascending or spreading; stems often with loosely spreading elongate branches............................ 12a. *A. ludoviciana* var. *latifolia*

7. Leaves mostly folded lengthwise, widely spreading or recurving, often twisted; stem or its erect basal branches with suppressed axillary fascicles.................................... 12b. *A. ludoviciana* var. *pabularis*

3. Leaves finely dissected or deeply lobed, only the uppermost ones sometimes entire.

9. Plant annual or biennial, with a taproot, glabrous throughout; involucres 2-3 mm. high; stem strict, very leafy, the leaves bipinnately parted or the upper ones pinnatifid, their lobes mostly cut-toothed................................ 7. *A. biennis*

9. Plants perennial (rarely biennial), with tough or woody bases or crowns, usually more or less pubescent.

10. Divisions of the leaves lance-acuminate, mostly more than 2 mm. broad at base; leaves green and nearly glabrous above, densely white-tomentose beneath; involucre 3-4 mm. high.

11. Inflorescence an ample leafy panicle with ascending spike-like branches; divisions of lower leaves again lobed or cleft, directed forward............................................................. 9. *A. vulgaris*

11. Inflorescence a narrow spike-like panicle, interrupted below; divisions of the lower leaves entire, spreading............................... 11. *A. tilesii*

10. Divisions of the leaves linear or filiform, mostly less then 1 mm. broad.

12. Stems decidedly woody, at least toward base; central florets fertile, their styles 2-cleft; involucre hemispheric, about 3 mm. high and 5 mm. broad.

13. Leaves green and essentially glabrous above, only sparsely pubescent beneath, divided into linear-filiform revolute segments. . 8. *A. abrotanum*

13. Leaves finely greyish-tomentose, especially beneath, their ultimate divisions short and blunt.............................. 13. *A. pontica*

12. Stems herbaceous, not decidedly woody at base; central florets sterile, their styles undivided.

14. Involucres hemispheric, 3-4 mm. long, 3·5-5 mm. broad.................................................................5. *A. canadensis*
14. Involucres subglobose, 2-3 mm. long and broad.
    15. Basal leaves green, they and the stem essentially glabrous.........................................................6. *A. caudata*
    15. Basal leaves greyish-pubescent; stem canescent-pilose, becoming glabrate................................6a. *A. caudata* var. *calvens*

1. A. ABSINTHIUM L. Wormwood. Absinthe

Roadsides and clearings in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, gravelly roadside (Scoggan, 1949). Earliest collection seen: Fort Garry (Schultz, 1860). First report: Fort Garry [Schultz, 1861].

European: widely naturalized in North America.

2. **A. frigida Willd.** Prairie-Sagewort

Dry prairie, sandhills, rock outcrops, and clearings in the southern, half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, rocky shore (Scoggan, 1949). Earliest collection seen: near Winnipeg, dry gravelly soil (Macoun, 1872). First report: "On limestone rocks on the higher parts of the Assiniboyne River, and sparingly on Red River" [Hooker, 1834].

(Arctic-)subarctic ?circumpolar: n. Alaska and nw. Mack. to n. Man., s. to Ariz., Tex., Kans., Minn., and Wisc.; introduced further eastward in North America; nw. Europe; Asia.

3. **A. cana** Pursh

Specimens have been seen from the following localities: Melita, about 60 miles southwest of Brandon, alkaline prairie of old Souris River channel (Scoggan, 1951); Oak Lake, about 30 miles west of Brandon, denuded prairie slope above Assiniboine River (Scoggan, 1953); Millwood, about 85 miles northwest of Brandon, dry prairie slope (Scoggan, 1951). First report "From the confluence of the Assiniboine and Qu'Appelle on arid clay or dry sand southwesterly across the plains" [Macoun, 1884].

Temperate western American: s. Alta. to sw. Man., s. to central Calif. and Kans. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Ward [Contrib. Dudley Herb. 4: 190 (fig. 9). 1953].

4. **A. glauca** Pall. (*A. dracunculus* L. subsp. *glauca* (Pall.) Hall & Clements; incl. *A. dracunculoides* Pursh) [*See* Fernald, Rhodora 47: 247-248. 1945].

Prairie, thickets, rock outcrops, and clearings in the southern third of the province. Northernmost collection: Dawson Bay, Lake Winnipegosis, limestone cliffs of Wilkins Point and Nason Island (Scoggan, 1948). Earliest collection seen: near Winnipeg, dry prairie (Macoun, 1872). First report: "On dry gravelly and sandy prairies and open plains from Manitoba to the Rocky Mountains and northward to Peace River.'

[Macoun, 1884]. According to Hall & Clements [1923, p. 117], *A. dracunculoides* seems to be merely a glabrous ecologic state of *A. glauca.*

Temperate western American: B.C. to Man. and Wisc., s. to N.M., Tex., and Mo.; adventive farther eastward; Siberia.

5. A. **canadensis** Michx.

Specimens appearing referable here have been seen from the following localities: Sandilands Forest Reserve, southeast of Winnipeg, sandy pine woods (Breitung, 1949); Gillam, about 165 miles south of Churchill, river bank (Schofield, 1950); Hayes River about 40 miles southwest of York Factory, clay-gravel floodplain of island (Scoggan, 1949); York Factory, landslide gully and clay-gravel beach (Scoggan, 1949); Nueltin Lake, lat. 59° 48′ N., gravel ridge (Baldwin, 1951). First report: Hayes River [Bell, 1881].

(Arctic-)subarctic American: north-central Alaska to n. Man., n. Que., s. Lab., and Nfld., s. to Colo., Mich., and Me. Perhaps better treated, like the following species, as a segregate of *A. campestris* L.

6. **A. caudata** Michx. (*A. campestris* L. subsp. *caudata* (Michx.) Hall & Clements)

Dry prairie, sandhills, fields, and clearings in the southern half of the province. Northernmost collection: Knee Lake, rocky island (Scoggan, 1949). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, sandy soil (Macoun, 1872). First report: "On gravel ridge west of Fort Ellice, Man." [Macoun, 1884].

Temperate American: Wash. and Sask. to sw. Que., s. to Tex. and Fla.

6a. **A. caudata** var. **calvens** Lunell (*A. camporum* Rydb.; *A. forwoodii* Wats.)

Similar habitats, but apparently less northern in its Manitoba distribution. Northernmost collection: Duck Mountain, roadside clearing (Scoggan & Baldwin, 1950). Earliest collection seen: Brandon, roadside (Macoun, 1896). First report: Morden [Lowe, 1943].

Temperate American: Sask. and Wash. to e. Ont. and w. N.Y., s. to Ariz., Neb., and Pa.

7. **A. biennis** Willd.

Shores, roadsides, and waste ground in the southern three-quarters of the province. Northernmost collections: York Factory (McTavish, 1854; Scoggan, 1949, landslide gully). Earliest collection seen: the foregoing McTavish specimen from York Factory. First report: "From York Factory and the Saskatchewan, to the Mackenzie River." [Hooker, 1834].

Temperate American: B.C. to e. Que., s. to Calif., Mo., and Pa.; native to western North America, but the original range now impossible to determine.

8. A. ABROTANUM L. Southernwood

Specimens have been seen from the following localities: Winnipeg around dwellings (Groh, 1929); Portage la Prairie (McMorine, 1896); Macgregor, about 20 miles west of Portage la Prairie, escaped from cultivation (Macoun & Herriot, 1906). First report: Winnipeg [Groh, 1944].

European: chiefly escaped from old gardens in North America.

9. A. VULGARIS L. Common Mugwort

A single specimen has been seen, from Brandon, where it was collected along a railway by Macoun in 1896. First report: Nelson River [Bell, 1880]. This northern citation, however, is probably referable to *A. tilesii*. The Brandon collection is recorded by J. M. Macoun [1897].

Eurasian: widely naturalized in eastern North America.

10. **A. longifolia** Nutt. (*A. vulgaris* L. subsp. *longifolia* (Nutt.) Hall & Clements)

Specimens appearing referable here have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg (Marshall, 1941); Roseisle, about 30 miles south of Portage la Prairie, clay hillside (Marshall, 1941); Pembina Mountain, south of Portage la Prairie, Benton shale exposure (Lowe, 1941); Wawanesa, about 20 miles southeast of Brandon, roadside (Scoggan, 1953); Brandon (Stevenson, 1953); Miniota, about 50 miles west-northwest of Brandon, denuded prairie slope above Assiniboine River (Scoggan, 1953). First report: "Manitoba" [N. Am. Fl. 34: 274. 1916]. Basis of the citation of *A. vulgaris* var. *heterophylla* Nutt. from near Morden by Lowe [1943].

Temperate western American: Mont. and s. Man. to w. Ont., s. to Wyo. and Colo. A map of the distribution, on which the occurrence of the species in southern Manitoba should be indicated, is given by Keck [1946, fig. 12, p. 436].

11. **A. tilesii** Ledeb.

Specimens have been seen from the following localities: Nelson River opposite Gillam Island, about 20 miles west-southwest of York Factory, gravel beach (Scoggan, 1949); Churchill (Macoun, 1910). First report: Churchill [Stormer, 1933; *A. vulgaris* var. *tilesii*]. Basis of reports of var. *elatior T.* & G. (*A. elatior* (T. & G.) Rydb.) from the province.

Arctic western American: n. coast of Alaska, Yukon, and Mack. to n. Banks I., s. to n. B.C. and n. Man.; isolated on s. James Bay. A map of the western part of the distribution, together with one of ssp. *unalaschensis* (Bess.) Hult. (var. *elatior* T. &. G.) is given by Keck [1946, fig. 18, p. 461], and a map of the distribution of the inclusive species is given by Raup [1947, pl. XXXVI].

12. **A. ludoviciana** Nutt. var. **gnaphalodes** (Nutt.) T. & G. (*A. gnaphalodes* Nutt.) Western Mugwort. White Sage

Prairie, sandhills, thickets, and clearings in the southern third of the province. Northernmost collection: Porcupine Mountain, roadside clearing (Scoggan & Baldwin, 1950). Earliest collection seen: near Fort Ellice, about 70 miles northwest of Brandon, dry hills (Macoun, 1872). First report: Burman [1910]. Probable basis of reports of the main form from the province. Basis of the citation of *A. purshiana* Bess. from Red River by Hooker [1834].

Temperate American (incl. the typical form): s. B.C. and central Alta. to s. Ont., s. to s. Calif., Tex., Ark., and Ind.; adventive farther eastward. A map of the distribution of the collective species, on which its occurrence in Manitoba should be indicated, is given by Keck [1946, fig. 14, p. 441].

12a. **A. ludoviciana** var. **latifolia** (Bess.) T. & G.

Similar habitats in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill, sandy railroad yard (Schofield, 1950). Earliest collection seen: Riding Mountain (Scamman, 1941). First report: Riding Mountain [Fernald, Rhodora 47: 253. 1945].

Temperate western American: s. B.C. to Man., s. to N.M., Kans., and Ia.; adventive farther eastward.

12b. **A. ludoviciana** var. **pabularis** (Nels.) Fern. (A. *pabularis* (Nels.) Rydb.)

Similar habitats in the southern part of the province. Northernmost collection: Grand Beach, near the south end of Lake Winnipeg, sandy depression behind beach (Breitung, 1949). Earliest collection seen: Crystal City, about 65 miles southeast of Brandon (Thomas, 1938). First report (with citation of localities): the present publication; but accredited to Manitoba in the range given by Fernald [1950].

Temperate western American: Oreg. to Sask. and Man., s. to Colo., Neb., and Ia.; adventive farther eastward.

13. A. PONTICA L. Roman Wormwood

Represented in the herbarium of the Division of Botany and Plant Pathology, Dept. of Agric., Ottawa, by a small sterile specimen collected in waste places at Dauphin, north of Riding Mountain, by Groh, in 1922. First report (with citation of locality): Dauphin [Groh, 1944].

European: naturalized in eastern North America.

### 37. PETASITES Mill.

### (Sweet Coltsfoot)

1. Leaves unlobed, deltoid-ovate, more or less cobwebby above, strongly white-tomentose beneath.......................................................1. *P. sagittatus*
1. Leaves deeply lobed, nearly glabrous above.

2. Leaves suborbicular to reniform, cleft more than two-thirds to base, more or less whitened beneath; achenes 1·5-2·5 mm. long........................2. *P. palmatus*
2. Leaves cordate-deltoid to reniform, cleft about half-way to midrib, white-tomentose beneath; achenes about 1 mm. long................................3. *P. vitifolius*

### 1. **P. sagittatus** (Pursh) Gray

Meadows, bogs, and muskeg forest throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the earliest seen from there having been made by Porsild in 1930). Earliest collection seen: York Factory (McTavish, 1854). First report: Churchill River [Bell, 1880].

(Arctic-)subarctic American: central Alaska to n. coast of Mack., n. Que., and central Lab., s. to Wash., Colo., Minn., and Wisc.

### 2. **P. palmatus** (Ait.) Gray

Thickets, light woods, and damp to swampy ground throughout the province except the southwestern prairie region. Northernmost collection: Baralzon Lake, lat. 60° N., edge of lake (Scoggan & Baldwin, 1950). Earliest collection seen: Assiniboine Rapids, near Brandon, "swamps and bogs" (Macoun, 1879). First report: Churchill River [Bell, 1880].

(Arctic-)subarctic American: south-central Yukon to Great Bear L., s. Keewatin, n. Lab., and Nfld., s. to s. B.C., se. Man., Minn., and N.E.

### 3. **P. vitifolius** Greene (Incl. *P. trigonophyllus* Greene)

Swampy ground and wet woods in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: near Winnipeg, swamps and bogs (Macoun, 1872). First report: Emerson (type locality) [Greene, Leaflets 1: 180. 1906]. Probable basis of the citation of *P. frigidus* (L.) Fries from Churchill by Størmer [1933], of *Nardosmia frigida* L. "From Lake Winnipeg, in lat. 52°, to Fort Franklin, in lat. 66°." by Hooker [1834] and Macoun [1884], and of *Nardosmia corymbosa* Hook. from between York Factory and Churchill by Rae [1850].

Subarctic American: central Yukon to s. Keewatin and n. Que., s. to s. B.C., s. Man., Minn., s. James Bay, and e. Que.

## 38. ARNICA L.

## (Arnica)

[*See* N. Am. Fl. 34: 321-357. 1927; Maguire, 1943.]

1. Pappus yellowish-brown or olive-tinged; leaves entire or remotely denticulate, the (4-)5-10 pairs of stem-leaves scarcely reduced above; rhizomes naked except for the reduced scales at the nodes..............................1. *A. chamissonis* ssp. *foliosa*
1. Pappus white; leaves mostly from below the middle of the stem, the upper ones considerably reduced; rhizomes clothed with overlapping scales and leaf bases.
    2. Old leaf bases at base of stem with dense tufts of long tawny hair in the axils; leaves mostly entire; plant of dry prairie habitats............................2. *A. fulgens*
    2. Old leaf bases lacking tufts of hair; plants of the Hudson Bay and low-northern regions.

3. Leaves entire or only remotely and inconspicuously toothed, the lower ones sessile or on short broad petioles............................3. *A. alpina* ssp. *attenuata*
3. Leaves regularly toothed, the lower ones on long slender petioles..................................................................4. *A. lonchophylla*

1. **A. chamissonis** Less. subsp. **foliosa** (Nutt.) Maguire (*A. foliosa* Nutt.)

Open ground and clearings in the southern four-fifths of the province. Specimens have been seen from the following localities: Winnipeg (Simpson, 1940); "west of the Assiniboine, prairies and open plains" (Macoun, 1872); Vista, about 60 miles northwest of Brandon (Cormack, 1926); Riding Mountain (Halliday, 1932, wet sandy shallow muskeg; Scoggan, 1953, roadside gravel); Dauphin, north of Riding Mountain (Fletcher, 1897); Ashern, about 80 miles north of Portage la Prairie, dry sandy clearing (Scoggan, 1951); Grahamdale, about 95 miles north of Portage la Prairie, open clayey soil (Scoggan, 1951); Gypsumville, about 120 miles north of Portage la Prairie (Freedman, 1950); Cross Lake, northeast of Lake Winnipeg, trail through spruce woods (Scoggan, 1948); The Pas, gravel in Indian cemetery (Krivda, 1953); Clearwater Lake, about 120 miles northeast of The Pas, stony ditch (McRae, 1946); Mile 214, Hudson Bay Railway, measured from The Pas (Emerton, 1917); Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915). First report: Churchill River [Bell, 1880]. Basis of the citation of *A. mollis* Hook. from Vista by Lowe [1943]. The Stewart Lake specimen was not seen.

Subarctic American: central Yukon to n. Man. and James Bay, s. to Calif. and n. N.M. A map of the distribution (incomplete in the north) is given by Maguire [1943, fig. 14, p. 462].

2. **A. fulgens** Pursh (*A. pedunculata* Rydb.)

Prairie of southern Manitoba. Specimens have been seen from the following localities: Brandon, open prairie (Macoun, 1896); Wheatland, about 20 miles northwest of Brandon (Macoun & Herriot, 1906); Assiniboine Rapids, near Brandon, prairie (Macoun, 1879); Oak Lake, about 30 miles west of Brandon, prairie slope above Assiniboine River (Scoggan, 1953); Melita, about 60 miles southwest of Brandon, native prairie 10 miles south of town (Dore & Lindsay, 1950); Medora, about 50 miles southwest of Brandon, moist prairie pasture (Dore & Lindsay, 1950); Bede, about 50 miles southwest of Brandon, gravelly prairie (Dore & Lindsay, 1950); Broomhill, about 60 miles southwest of Brandon, dry prairie (Scoggan, 1953). First report: Bede, Medora, and near Melita [Boivin, Rhodora 55: 56. 1953].

Temperate western American: s. B.C. to s. Man., s. to Oreg., Nev., and Colo. A map of the distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Maguire [1943, fig. 4, p. 424].

3. **A. alpina** (L.) Olin subsp. **attenuata** (Greene) Maguire (*A. attenuata* Greene; *A. lowii* Holm.; *A. terrae-novae* Fern.; incl. *A. wilsonii* Rydb.)

Rocky ground, shores, and clearings in the northern third of the province. Specimens have been seen from the following localities: Gillam, about

165 miles south of Churchill (Simpson, 1942); Kettle Rapids, near Gillam (Emerton, 1917); Nelson River near Limestone Rapids, about 155 miles south of Churchill, wooded shore (Scoggan, 1949); Nelson River near "Head of Navigation", about 140 miles south of Churchill, clay banks (Scoggan, 1949); Hayes River, about 40 miles from York Factory, clay-gravel flood-plain of small island (Scoggan, 1949); York Factory (McTavish, 1854); Churchill (several collections, the first by McTavish in 1852). First report: Kettle Rapids [Fernald, Rhodora 35: 366. 1933; *A. terrae-novae*]. Basis of reports of the main form from the province, and of *A. angustifolia* Vahl (*A. alpina* ssp. *angustifolia* (Vahl) Maguire) from "Echimamish River to Oxford House" by Bell [1881]. Probable basis of the citation of *A. montana* L. var. *angustifolia* (Vahl) Hook. from between York Factory and Churchill by Rae [1850].

Subarctic American: north-central Alaska to nw. Mack., s. Keewatin, and n. Que. [*see* Boivin, Rhodora 55: 56. 1953], s. to sw. Alaska and n. Ont. Maps of the distribution (incomplete in the east) are given by Maguire [1943, fig. 1, p. 409] and Hultén [Svensk Botanisk Tidskrift 43: 405 (fig. 11). 1949].

4. **A. lonchophylla** Greene

Specimens have been seen from the following localities: The Pas, open woods 25 miles north of town (Krivda, 1950); Cross Lake, northeast of Lake Winnipeg, gravel ridge (Scoggan, 1948); Hayes River near Berwick Falls, about 110 miles southwest of York Factory, clay banks (Scoggan, 1949); Hayes River about 60 miles southwest of York Factory, clay banks (Scoggan, 1949); Churchill River between Southern Indian Lake and the mouth of Little Churchill River (Cairnes, 1915); Nueltin Lake, lat. 59° 43′ N., gravel ridge (Baldwin, 1951). First report: Hayes River [Scoggan, 1951].

Subarctic western American: central Alaska and nw. Mack. to s. Keewatin, s. to s. Alta. and n. Man.; in e. Que. and Nfld., ssp *chionopappa* (Fern.) Maguire. A map of the distribution (incomplete in the north), on which the occurrence of the species in northern Manitoba should be indicated, is given by Maguire [1943, fig. 6, p. 429].

## 39. SENECIO L.

### (Groundsel)

[*See* Greenman, 1916.]

1. Plants annual or biennial, without branching rhizomes or basal leafy tufts.
    2. Ligules conspicuous; inflorescence more or less woolly with many-jointed hairs; involucres without an outer series of basal bractlets; stems soft and hollow; plants of wet habitats.
        3. Stem 1·5-3 dm. high; inflorescence very dense, strongly woolly; plant of the Hudson Bay region........................................1. *S. congestus*
        3. Stem up to 8 dm. high; inflorescence more open.
            4. Inflorescence more or less villous-lanate.............*S. congestus* var. *palustris*
            4. Inflorescence merely pubescent, with few long villi..........................................................................*S. congestus* var. *tonsus*

2. Ligules none or inconspicuous; involucres with an outer series of bractlets at base; plants of waste places.
    5. Phyllaries heavily glandular-hispid, about twice as long as the basal bractlets; achenes glabrous; stem firm. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2. *S. viscosus*
    5. Phyllaries glabrous, black-tipped, many times longer than the blackish bractlets; achenes minutely pubescent; stem relatively soft. . . . . . . . . . . . . . . . . . . 3. *S. vulgaris*

1. Plants perennial by more or less well developed rhizomes or leafy-tufted crowns.
  6. Plant equally leafy throughout, the leaves pinnatifid; stem up to 1 m. or more in height; achenes minutely pubescent. . . . . . . . . . . . . . . . . . . . . . . . . . . . 4. *S. eremophilus*
  6. Plants with upper stem-leaves more or less reduced; stem lower; achenes glabrous or sometimes pubescent.
    7. Rootstocks erect and very short, with numerous fleshy-fibrous roots; leaves entire or more or less toothed; achenes glabrous. . . . . . . . . . . . . . . . . . . . . . 5. *S. integerrimus*
    7. Rootstocks well developed, horizontal or ascending.
      8. Basal leaves entire; plant silvery-tomentose throughout (or occasionally more or less glabrate especially on the upper leaf-surface); achenes glabrous. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6. *S. canus*
      8. Basal leaves toothed or lobed; plant glabrous or more or less pubescent.
        9. Achenes pubescent.
          10. Plant essentially glabrous; stems frequently rather densely tufted, 2-3 dm. high. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7. *S. tridenticulatus*
          10. Plant more or less white-tomentose; stems solitary or few together, 2-5 dm. high. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8. *S. plattensis*
        9. Achenes glabrous; stems mostly solitary.
          11. Basal leaves cordate or subcordate at base. . . . . . . . . . . . . . . . . . 9. *S. aureus*
          11. Basal leaves tapering to petiole. . . . . . . . . . . . . . . . . . . . . . . 10. *S. pauperculus*

1. **S. congestus** (R. Br.) DC. (Incl. var. *palustris* (L.) Fern. and var. *tonsus* Fern.) Marsh-Fleabane

Marshes and wet shores throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the earliest seen having been made by Porsild in 1930). Earliest collection seen: Fort Garry, marshes and ponds (Macoun, 1872). First report: near York Factory ["H", Richardson, in Franklin, 1823; as *Cineraria palustris*]. Most of the Manitoba material appears referable to var. *palustris*, although, as noted by Hultén [1950, p. 1609], "The variation within this species is very large, and it seems meaningless to distinguish and name different types as the variation is too irregular."

Arctic circumpolar: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (to Melville I.), n. Que., and s. Lab., s. to s. Alta., s. Man., N.D., n. Ia., and e. Que.; n. Eurasia.

2. S. VISCOSUS L.

Known in Manitoba only from Winnipeg, where it was first collected by Denike in 1939. First report: Winnipeg [Senn, Can. Field-Nat. 55: 19. 1941].

European: naturalized in eastern North America.

3. S. VULGARIS L. Common Groundsel

Fields and waste ground in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). Earliest collection seen: Dauphin, north of Riding Mountain (Groh. 1922). First report: near Aweme [Criddle, 1927].

European: widely naturalized in North America.

4. **S. eremophilus** Richards.

Thickets, open woods, and damp ground in the southern two-fifths of the province. Northernmost collection: The Pas, woods (Krivda, 1950). Earliest collection seen: Swan River, north of Duck Mountain (Groh, 1922). First report: Cedar Lake, north of Lake Winnipegosis [Macoun, 1884]. Probable basis of most or all reports of *S. jacobaea* L. from the province.

Temperate western American: Alta. to Man., s. to Wyo. and S.D.

5. **S. integerrimus** Nutt.

Thickets and prairie in the southern part of the province. Northernmost collection: The Narrows, Lake Manitoba, dry gravelly soil (Macoun, 1881). Earliest collection seen: East Crossing of the Souris River, west of Turtle Mountain (Burgess, 1874). First report: limestone rocks at The Narrows, Lake Manitoba, and near Brandon [Macoun, 1884].

Temperate western American: B.C. to Man., s. to Ida., Colo., and Ia.

6. **S. canus** Hook.

Dry prairie and gravelly soil in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, limestone-gravel ridge (Scoggan, 1948). Earliest collection seen: Souris Co. (Walker, 1889). First report: "Very abundant on many parts of the prairie region from the eastern part of Manitoba to the Rocky Mountains." [Macoun, 1884].

Temperate western American: B.C. to Man., s. to Calif., Colo., and Neb.

7. **S. tridenticulatus** Rydb. (*S. densus* Greene; *S. manitobensis* Greenm.)

Dry prairie and sandhills in the southern part of the province. Northernmost collection: Petrel, about 25 miles east-northeast of Brandon, sandhills (Macoun & Herriot, 1906). Earliest collection seen: Sewell (now Camp Hughes), near Brandon, open prairie (Macoun, 1896). First report: Brandon, sandhills [Greenman, Ottawa Naturalist 25: 117. 1911].

Temperate western American: Sask. and Man., s. to Colo. and Neb.

8. **S. plattensis** Nutt.

Prairie, sandhills, gravel ridges, and open ground in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, limestone-gravel ridge (Scoggan, 1948). Earliest collection seen: Fort Ellice, about 70 miles northwest of Brandon, "gravelly or rocky places" (Macoun, 1879). First report: Stony Mountain, Sewell, and Fort Ellice [Greenman, Ann. Mo. Bot. Gard. 3: 149. 1916].

Basis of the citation of the doubtfully distinct *S. willingii* from Ninga by Greenman [Ottawa Naturalist 25: 118. 1911].

Temperate American: Sask. to s. Ont. and Vt., s. to Ariz., Tex., La., Ind., and Va.

9. **S. aureus** L. (Incl. *S. pseudaureus* Rydb.)

Thickets, prairie, and open ground in the southern part of the province. Northernmost collection seen: Duck Mountain, roadside clearing (Scoggan, & Baldwin, 1950). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open swampy prairie (Burgess, 1873). First report: between York Factory and Churchill [Rae, 1850]. This northern citation, however, may be referable to the following species.

Subarctic American (the collective species): s. B.C. to n. Que. and Nfld., s. to Calif., N.M., Ark., and Fla.

10. **S. pauperculus** Michx.

Thickets, prairie, shores, and open ground throughout the province except the extreme north. Northernmost collection: Churchill (several collections, the earliest seen being made by McTavish in 1853). Earliest collection seen: the foregoing McTavish specimen from Churchill. First report: Brenda, near Turtle Mountain [Jackson *et al.*, 1922]. Probable basis of the citations of S. *aureus* var. *balsamitae* from near Fort Ellice by Macoun [1884] and from Churchill by Tyrrell [1897], of *S. lugens* Richards. from Churchill by Lowe [1943], of *S. lugens* var. *parryi* Wats. from near Turtle Mountain by Dawson [1875], of *S. aureus* var. *borealis* (*S. ?pauciflorus* Pursh) from between York Factory and Churchill by Bell [1884], and of *Cineraria integrifolia* Willd. from near York Factory by Richardson ["H", in Franklin, 1823] and from near Turtle Mountain by Dawson [1875].

Subarctic American: central Alaska and Great Bear L. to s. Keewatin, n. Que., and Nfld., s. to Calif., N.M., Neb., Ind., Ala., and Ga. A map of the distribution is given by Raup [1947, pl. XXXVI].

## 40. ARCTIUM L.

## (Burdock)

1. Heads racemose or racemosely clustered, sessile or very short-peduncled, 1·5-2·5 cm. broad; middle and inner phyllaries shorter than corollas; larger leaf-blades tapering at summit; petioles usually hollow, only slightly angled. . . . . . . . . . . . . . . . . . . . . . 1. *A. minus*
1. Heads corymbose, long-peduncled; larger leaf-blades rounded at summit; petioles strongly angled.
    2. Petioles mostly solid; heads 3-4·5 cm. broad; involucre glabrous, its middle and inner phyllaries subequal and exceeding corollas. . . . . . . . . . . . . . . . . . . . . . . . . . 2. *A. lappa*
    2. Petioles usually hollow; heads 2-2·7 cm. broad; involucre often cobwebby, its middle and inner phyllaries successively longer, mostly shorter than corollas. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3. *A. tomentosum*

1. A. MINUS (Hill) Bernh. Common Burdock

Specimens have been seen from the following localities: Winnipeg and vicinity (Marquardt, 1931; Garton, 1944; Groh, 1945); Morden, about 60 miles southwest of Winnipeg (Marshall, 1941); Brandon, ditch (Macoun, 1896). It is an introduced species of waste land. First report: Jackson *et al.* [1922].

Eurasian: widely naturalized in North America.

2. A. LAPPA L. Great Burdock

Waste land in the southern two-fifths of the province. Northernmost collection: Warren Landing, northeast end of Lake Winnipeg, sandy field (Scoggan, 1948). Earliest collection seen: Winnipeg (Mawson, 1918). First report: Burman [1910].

Eurasian: widely naturalized in North America.

3. A. TOMENTOSUM Mill.

Waste land in the southern part of the province. Northernmost collection: Pine River, near the east edge of Duck Mountain, roadside (Frankton, 1950). Earliest collection seen: Emerson, at the International Boundary south of Winnipeg (Groh, 1922). First report: Emerson [Lowe, 1943].

Eurasian: naturalized in eastern North America.

## 41. CIRSIUM Mill.

1. Flowering stems arising from extensively creeping and freely sprouting roots; flowers dioecious; involucres 1-2 cm. high.
  2. Leaves strongly sinuate-pinnatifid and prickly-margined................1. *C. arvense*
  2. Leaves merely undulate-lobed and with few, fine and short, prickles.......................................1a. *C. arvense* var. *mite*
1. Flowering stems arising from centre of previous year's basal rosette; flowers perfect; involucres mostly higher.
  3. Upper half of stem and branches with bristly lobed elongate wings decurrent from the leaf-bases; leaves finely bristly above............................2. *C. vulgare*
  3. Upper half of stem and branches essentially wingless; leaves bristly only along margins.
    4. Inner phyllaries with conspicuously dilated crisp twisted tips; mature involucres 3-5 cm. high; leaves green and only slightly cobwebby...........3. *C. drummondii*
    4. Inner phyllaries narrowed to the non-twisted apex.
      5. Phyllaries unarmed, not prickle-tipped; leaves green above, paler and more or less cobwebby beneath........................................4. *C. muticum*
      5. Phyllaries prickle-tipped; leaves white-felted beneath.
        6. Leaves green and essentially glabrous above; prickles at tips of outer phyllaries weak and recurved..........................................5. *C. discolor*
        6. Leaves grey-tomentose above; prickles at tips of outer phyllaries firm, ascending or somewhat spreading................................6. *C. flodmanii*

1. C. ARVENSE (L.) Scop. Canada Thistle

Fields and waste places in the southern half of the province. Northernmost collection: Herb Lake village on Wekusko Lake, about 90 miles northeast of The Pas, clearing (Scoggan, 1949). Earliest collection seen: Brandon, streets (Macoun, 1896). First report: Burman [1910].

Eurasian: widely naturalized in North America.

Forma *albiflorum* (Rand & Redf.) Hoffm., with white florets, is of frequent occurrence with the main form.

1a. C. ARVENSE var. MITE (Rand & Redf.) Hoffm.

Specimens have been seen from the following localities: Fort Garry (Simpson, 1938; Dore & Breitung, 1950, roadside ditch); Methven, about 20 miles southeast of Brandon (Rogers, 1931); Virden, about 45 miles west of Brandon, thicket (Scoggan, 1951); Elkhorn, about 60 miles west of Brandon (Groh, 1932). First report: the present publication.

Eurasian: sparingly naturalized in North America.

2. C. vulgare (Savi) Tenore (*C. lanceolatum* of auth., not Hill) Bull-thistle

A single specimen has been seen, from Winnipeg Beach, where it was collected in a dry field among *Juniperus communis* by the writer in 1951. First report: Winnipeg and Elm Creek [Groh, 1944].

Eurasian: widely naturalized in North America.

3. **C. drummondii** T. & G. (*Cnicus drummondii* T. & G.)

Sandy open soil in the southern two-fifths of the province. Specimens have been seen from the following localities: Sandilands Forest Reserve (Lowe, 1940); about 40 miles east of Winnipeg (Scott, 1927); Vivian, about 20 miles east of Winnipeg (Lowe, 1944, moist gravel); Moosehorn, about 90 miles north of Portage la Prairie, grassy clearing (Scoggan, 1951; approaching the short-stemmed var. *acaulescens* (Gray) Macbr.); Fairford, about 110 miles north of Portage la Prairie, grassy clearing (Scoggan, 1951); Binscairth, about 80 miles northwest of Brandon, prairie (Burman, 1897); Duck Mountain (Frankton, 1950); Grand Rapids, near the northwest end of Lake Winnipeg, grassy clearing (Scoggan, 1948); 21 and 23 miles north of The Pas, roadside clay along road to Lake Atikameg (Krivda, 1954; "most likely a recent introduction from wheat trains on way to Churchill"). First report: "From the head of Lake Winnipegoosis, westward throughout the wooded and mixed prairie country to the Rocky Mountains and Peace River." [Macoun, 1884]. Basis of reports of *C. hillii* (Canby) Fern. from the province, and of the citation of *Onopordum acanthium* L. from near Winnipeg by Lowe [1943].

Temperate western American: B.C. to Man., s. to Calif., Colo., and S.D.

4. **C. muticum** Michx.

Low woods, thickets, and swampy ground in the southern half of the province. Northernmost collection: Cross Lake, northeast of Lake Winnipeg, portage through woods (Scoggan, 1948). Earliest collection seen: Goose Island, Lake Winnipeg, low woods (Macoun, 1884). First report: Spruce Woods Forest Reserve, marshy ground [Shimek, 1927].

(Subarctic-)temperate eastern American: e. Sask. and central Man. to s. Lab. and Nfld., s. to Tex. and Fla.

5. **C. discolor** (Muhl.) Spreng.

A single specimen has been seen from Emerson, near the International Boundary south of Winnipeg, where it was collected by Groh in 1922. First report: Winnipeg, thickets [J. M. Macoun, 1897; as *Cnicus altissimus* Willd. var *discolor* Gray]. Probable basis of the citation of *C. altissimum* (L.) Spreng. from Turtle Mountain by Dawson [1875].

Temperate eastern American: s. Man. to sw. Que., s. to Mo., Tenn., and Ga.

6. **C. flodmanii** (Rydb.) Arthur

Prairie, fields, meadows, and clearings in the southern part of the province. Northernmost collection: Grandview, north of Riding Mountain, grassy field (Scoggan, 1951). Earliest collection seen: Winnipeg, "prairies and open plains" (Macoun, 1872). First report: southwestern Manitoba [Lowe, 1943]. Basis of reports of *C. undulatum* (Nutt.) Spreng. and its var. *megacephalum* (Gray) Fern. (*C. megacephalum* (Gray) Cockerell) from the province. This, according to Ownbey [Rhodora 54: 30. 1952], is a more southerly species, ranging from the Pacific Coast states to North Dakota and Texas.

Temperate western American: Sask. and Man., s. to Colo. and Ia.

Forma *albiflorum* D. Löve, with white florets, has been collected by H. A. Senn near Letellier, about 50 miles south of Winnipeg, and by A. & D. Löve near Langruth, about 30 miles northwest of Portage la Prairie.

### 42. CARDUUS L.

1. C. NUTANS L. var. LEIOPHYLLUS (Petrov.) Arenes  Musk-Thistle

A single specimen has been seen, from near Haywood, about 20 miles south of Portage la Prairie, where it was collected along a grassy roadside by Dore & Breitung in 1950. First report: near Haywood [Mulligan & Frankton, Can. Field-Nat. 68: 35. 1954].

European: sparingly naturalized in North America.

### 43. CENTAUREA L.

(Star-Thistle)

1. Phyllaries, at least the outer ones, tipped by a stout spreading or reflexed yellow spine (mostly 1·5-2 cm. long) with several much smaller ones at its base; flowers yellow; basal leaves pinnatifid; stem-leaves mostly entire, the stem and branches winged by their decurrent bases........................................1. *C. solstitialis*

1. Phyllaries not spine-tipped; flowers purple or blue; stem and branches wingless.
   2. Marginal flowers much enlarged and ray-like; all of the phyllaries fringed at tip; plant annual, woolly at least in youth..............................2. *C. cyanus*
   2. Marginal flowers not ray-like; outer phyllaries entire; plant perennial....3. *C. repens*

1. C. SOLSTITIALIS L.  Yellow Star-Thistle

A single specimen has been seen, from Shellmouth, about 100 miles northwest of Brandon, where it was collected by J. S. Bond in 1926. First report: Shellmouth [Groh, 1944].

European: naturalized in temperate North America.

2. C. CYANUS L.  Bachelor's-button. Bluebottle. Cornflower

Specimens have been seen from the following localities: Dauphin, north of Riding Mountain, garden escape (Groh, 1932); Norway House, near the northeast end of Lake Winnipeg, clearing near trading post (Scoggan, 1948). First report: Dauphin [Groh, 1944].

European: escaped from cultivation in North America.

3. C. REPENS L. (*C. picris* Pall.)

Specimens have been seen from the following localities: Boissevain, north of Turtle Mountain (Pettypiece, 1940); Hartney, about 35 miles southwest of Brandon (Taylor, 1940); Melita, about 60 miles southwest of Brandon (Farrow, 1940); Ewart, about 60 miles west-southwest of Brandon (Good, 1935). First report: Hartney, Melita, and Boissevain [Groh, 1944].

Asiatic: naturalized in temperate western North America.

### 44. LAPSANA L.

### (Nipplewort)

1. L. COMMUNIS L.

A single specimen has been seen, from Winnipeg, where it was collected as a garden weed by Lowe in 1943. First report: Winnipeg [Lowe, 1943].

Eurasian: naturalized in temperate North America.

### 45. CICHORIUM L.

1. C. INTYBUS L. Common Chicory. Blue Sailors

Specimens have been seen from the following localities: Winnipeg and vicinity (Simpson, 1934; Denike, 1944; Frankton, 1949); Morden, about 60 miles southwest of Winnipeg, waste land (Scoggan, 1953). First report: [Burman, 1910].

Eurasian: widely naturalized in North America.

### 46. KRIGIA Schreb.

### (Dwarf Dandelion)

1. **K. biflora** (Walt.) Blake (*K. amplexicaulis* Nutt.; *Cynthia virginica* (L.) Don, not *K. virginica* (L.) Willd.)

Specimens have been seen from the following localities: "Lake Winnipeg" (no data); Teulon, about 30 miles north of Winnipeg, banks of ditch (R. F. Peterson, 1929). First report: near Lake Winnipeg [Macoun, 1884]. The above specimens are referable to forma *glandulifera* Fern., with glandular peduncles.

Temperate American: Man. to N.E., s. to Ariz., N.M., Mo., and Ga.

### 47. TRAGOPOGON L.

### (Goat's-beard)

1. Flowers purple; peduncles upwardly enlarged.......................... *T. porrifolius*
1. Flowers yellow.
    2. Peduncles slenderly cylindric; involucres 2-3 cm. high; achenes 1·5-2·5 cm. long.......................................................... 1. *T. pratensis*
    2. Peduncles upwardly enlarged; involucres 5-7 cm. high; achenes 2-4 cm long.......................................................... 2. *T. dubius*

1. T. PRATENSIS L. Goat's-beard

Specimens appearing referable here have been seen from the following localities: Winnipeg (Hunter, 1940; Denike, 1940); Treherne, about 30 miles southwest of Portage la Prairie (Simpson, 1941). It is a weed of fields and rocky places. First report: Jackson *et al.* [1922]. Reported also from Aweme by Criddle [1927].

European: naturalized in North America.

2. T DUBIUS Scop. (*T. major* Jacq.) [*See* Montgomery, Rhodora 55: 325-328. 1953].

Fields and waste places of southern Manitoba. Northernmost collection: Lac du Bonnet, about 50 miles northeast of Winnipeg, dry sandy clearing (Scoggan, 1951). Earliest collection seen: Waskada, west of Turtle Mountain (unknown collector, 1931). First report: Lowe [1943].

European: naturalized in temperate North America, particularly in the West.

*T. porrifolius* L., Salsify or Oyster-plant, is listed by Lowe [1943] as a garden escape. No specimens have been seen, however, and it should be excluded from our flora for the present.

## 48. TARAXACUM Zinn

## (Dandelion)

[*See* Fernald, Rhodora, 35: 369-386. 1933; Haglund, Rhodora 45: 337-343. 1943.]

1. Achenes red or reddish-purple at maturity........................1. *T. erythrospermum*
1. Achenes greyish to pale brown.
    2. Many of the phyllaries with a horn-like appendage below tip.
        3. Mature achenes mostly tuberculate nearly to base............2. *T. ceratophorum*
        3. Mature achenes tuberculate only above the middle.................3. *T. lacerum*
    2. Phyllaries unappendaged.
        4. Leaves mostly broad at base or with broadly winged petioles; marginal lobes mostly entire.....................................................4. *T. lapponicum*
        4. Leaves tapering to narrow, scarcely winged, petioles; marginal lobes often toothed and with intermediate teeth..................................5. *T. officinale*.

1. T. ERYTHROSPERMUM Andrz. (*T. laevigatum* (Willd.) DC. var. *erythrospermum* Andrz.) [*See* Shinners, Field & Lab. 17: 16-18. 1949.] Red-seeded Dandelion

Specimens have been seen from the following localities: near Vivian, about 25 miles east of Winnipeg, meadow (A. & D. Löve, 1952); Winnipeg (Buller, 1928); Melita, about 60 miles southwest of Brandon (Dore & Lindsay, 1950); Brandon, damp grassland (Stevenson, 1953); Souris River south of Brandon, prairie slope (Scoggan & Baldwin, 1950); Roblin, about 110 miles northwest of Brandon (Simpson, 1938); Riding Mountain, sandy shore of Clear Lake (Halliday, 1930); Playgreen Lake, north of Lake Winnipeg, sandy shore (Scoggan, 1948); Gillam, about 165 miles south of Churchill, damp humus near woodland road (Schofield, 1950). Reported also from Aweme by Criddle [1927], from near Carberry by Shimek [1927], and from Churchill by Radforth [1950]. First report: Jackson *et al.* [1922; as *Leontodon erythrospermum*].

Eurasian: naturalized in temperate North America.

2. **T. ceratophorum** (Ledeb.) DC.

Specimens appearing referable here have been seen from the following localities: Norway House, near the northeast end of Lake Winnipeg, fields and rock outcrops (Scoggan, 1948); Hill Lake, north of Lake Winnipeg, banks of Hargrave River (Scoggan, 1948); Cross Lake, northeast of Lake Winnipeg, portage through woods (Scoggan, 1948); Nelson River at High Rock, about 20 miles northeast of Norway House, open spruce woods (Scoggan, 1948); Churchill (Beckett, 1953). First report: Churchill [Polunin, 1940].

(Arctic-)subarctic ?American: central Mack. to s. Baffin I., n. Que., and Nfld., s. to s. B.C., n. Sask., and e. Que.; Asia. A map of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXXVII].

3. **T. lacerum** Greene (Incl. *T. dumetorum* Greene, *T. russeolum* Dahlst., and *T. hyperboreum* Dahlst.)

Specimens have been seen from the following localities: Cross Lake, northeast of Lake Winnipeg, fields (Scoggan, 1948); Nelson River between Pipestone Lake and Cross Lake, shore (Scoggan, 1948); Oxford Lake, cleared land (Scoggan, 1949); Limestone River, about 155 miles south of Churchill, shore (Schofield, 1950); Hayes River opposite the mouth of Fox River, gravel-cobble beach (Scoggan, 1949); Nelson River opposite Gillam Island, gravel-cobble beach (Scoggan, 1949); York Factory, landslide gully and gravel-cobble beach (Scoggan, 1949); Churchill (several collections, the first by Macoun in 1910). First report: Churchill [Haglund, Rhodora 45: 339. 1943]. Probable basis of the citation of *T. officinale* var. *alpinum* Koch from Churchill by Tyrrell [1897].

Arctic American: n. coast of Alaska, Yukon, and Mack., Can. Arct. Arch. (n. to Prince Patrick I.), n. Que., n. Lab., and Nfld., s. to north-central B.C., central Man., and Mingan I., Que.; w. Greenland. A map of the distribution is given by Raup [1947, pl. XXXVII].

4. **T. lapponicum** Kihlm.

Specimens appearing referable here have been seen from the following localities: Norway House, near the northeast end of Lake Winnipeg, fields (Scoggan, 1948); Hayes River at Robinson Portage, about 70 miles northeast of Norway House (Scoggan, 1949); Hayes River at The Rock, about 100 miles southwest of York Factory, gravel-cobble beach and wooded shore (Scoggan, 1949). First report: the present publication.

Arctic circumpolar: sw. Mack. to south-central Baffin I., n. Que., n. Lab., and Nfld., s. to n. B.C., central Man., James Bay, and e. Que.; southern half of w. Greenland; n. Eurasia. A map of the American distribution, on which the occurrence of the species in Manitoba should be indicated, is given by Raup [1947, pl. XXXVII].

5. T. OFFICINALE Weber   Common Dandelion

Open ground throughout the province except the extreme north. Northernmost collection: Churchill (MacKinnon, 1947). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873). First report: Oxford House to Knee Lake [Bell, 1881; as *T. palustre*]. Probable basis of the citations of *T. officinale* var. *alpinum* Koch and *T. latilobum* DC. from near Fort Ellice by Macoun [1884] and Jackson *et al.* [1922], respectively.

Eurasian: widely naturalized in North America.

### 49. SONCHUS L.

### (Sow-Thistle)

1. Plant perennial, with long creeping rootstocks; heads up to 5 cm. broad, the flowers bright yellow; involucre about 1·5 cm. high; achenes striate and papillose.
  2. Peduncles and involucres glandular-hispid.............................1. *S. arvensis*
  2. Peduncles and involucres glabrous or nearly so.........1a. *S. arvensis* var. *glabrescens*
1. Plants annual, with tap-roots; heads 1-2·5 cm. broad, pale yellow; involucre about 1 cm. high.
  3. Achenes striate and papillose; basal auricles of leaves acute; leaves with soft spiny teeth.....................................................2. *S. oleraceus*
  3. Achenes 3-nerved on each side, otherwise smooth; basal auricles of leaves rounded; leaves strongly spiny-toothed.........................................3. *S. asper*

1. S. ARVENSIS L.   Field Sow-Thistle

Specimens have been seen from the following localities: Morden, about 60 miles southwest of Winnipeg (Marshall, 1942); Turtle Mountain (Jackson 1921); Portage la Prairie (McMorine, 1896); Brandon (Macoun, 1896, railway yard; Stevenson, undated, pasture); Wawanesa, about 20 miles southwest of Brandon, denuded prairie crest above Souris River, with var. *glabrescens* (Scoggan, 1953); Minitonas, north of Duck Mountain, waste ground, a single plant in a large colony of var. *glabrescens* (Scoggan, 1951); Carrot River district, north of The Pas, roadside and fields (Frankton, 1950). First report: Brandon [J. M. Macoun, 1897]. Much less abundant than the following variety.

European: widely naturalized in North America.

1a. S. ARVENSIS var. GLABRESCENS Guenth., Grab., & Wimm.   (*S. ?uliginosus* Bieb.)

Open ground in the southern two-thirds of the province. Northern most collection: Gillam, about 165 miles south of Churchill, railway embankment (Schofield, 1950). Earliest collection seen: Winnipeg Beach, near the south end of Lake Winnipeg (Lowe, 1908). First report: Lowe [1943; *S. uliginosus*]. Basis of most reports of the main form from the province.

European: locally abundant in eastern North America.

2. S. OLERACEUS L.   Common Sow-Thistle

Specimens have been seen from the following localities: Winnipeg (Simpson, 1944); Morden, about 60 miles southwest of Winnipeg, street

(Scoggan, 1953); Brandon (Stevenson, undated). First report: "Naturalized from Newfoundland to Manitoba and British Columbia." [Macoun, 1884].

European: widely naturalized in North America.

3. S. ASPER (L.) Hill Spiny-leaved Sow-Thistle

Specimens have been seen from the following localities: Winnipeg (Jackson, 1923); Morden, about 60 miles southwest of Winnipeg (Marshall, 1942; Scoggan, 1953, street); Pilot Mound, about 60 miles south-southwest of Portage la Prairie (Mathers, 1948); Portage la Prairie (McMorine, 1896); Brandon (Macoun, 1896, old garden; Stevenson, undated); Birtle, about 60 miles northwest of Brandon (Dudley, 1930); Melita, about 60 miles southwest of Brandon, street (Scoggan, 1951); Swan River, north of Duck Mountain (Groh, 1922). First report: Burman [1910].

European: widely naturalized in North America.

Forma *glandulosa* Beckh., with stem red-glandular above and in the inflorescence, was collected at Bowsman River, north of Duck Mountain, by T. Grant in 1931.

## 50. LACTUCA L.

## (Lettuce)

1. Achenes beakless or with short firm beak; flowers blue.
   2. Pappus light brown; achenes nearly beakless, thickish; leaves irregularly pinnatifid..........1. *L. biennis*
   2. Pappus white; achenes with short firm beak, thin and flat; leaves entire or the lower more or less lobed..........2. *L. pulchella*
1. Achenes with a distinct soft filiform beak, very flat; flowers yellow, sometimes drying purple or bluish (rarely blue from the first); pappus white; leaves mostly pinnatifid.
   3. Heads 5-12-flowered; achenes 5-7-nerved on each face; leaves copiously spinulose-denticulate and usually spinulose-bristly on the midrib beneath, tending to turn with one edge up..........3. *L. scariola*
   3. Heads 12-20-flowered; achenes 1-3-nerved on each face.
      4. Leaves spinulose-margined and more or less prickly on the midrib beneath, strongly glaucous; involucre 1·7-2·3 cm. long; flowers yellow or blue......4. *L. ludoviciana*
      4. Leaves neither spinulose-margined nor strongly glaucous; involucre 1-1·4 cm. long; flowers yellow.
         5. Lobes of the leaves linear-falcate, usually entire..........5. *L. canadensis* var. *longifolia*
         5. Lobes of the leaves broadly falcate, or obovate and obliquely truncate, entire or toothed..........5a. *L. canadensis* var. *latifolia*

1. **L. biennis** (Moench) Fern. (*L. spicata* of auth., not *Sonchus spicatus* Lam.; *L. leucophaea* (Willd.) Gray (*Mulgedium leucophaeum* Willd.)

Specimens have been seen from the following localities: Victoria Beach, near the south end of Lake Winnipeg (Lowe, 1928); Bloodvein River, entering at The Narrows, Lake Winnipeg, low woods and borders of marshes (Macoun, 1884); Portage la Prairie (McMorine, 1896), Brandon (Macoun, 1896, damp thickets; Stevenson, 1941); Riding Mountain (Sparling, 1938); Red Deer River, entering Dawson Bay, Lake Winnipegosis (Macoun, 1881); Lake Winnipegosis, trail through black spruce woods, East Mossy Portage

(Scoggan, 1948). First report: Burman [1910; *L. leucophaea*]. Basis of reports of *L. spicata* Lam. from the province.

(Subarctic-)temperate American: B.C. to Nfld., s. to Oreg., Colo., Ia., Tenn., and N.C.

2. **L. pulchella** (Pursh) DC. (*L. tatarica* (L.) Mey. subsp. *pulchella* (Pursh) Stebbins)

Prairie, sandhills, shores, and clearings in the southern two-thirds of the province. Northernmost collection: Gillam, about 165 miles south of Churchill (Schofield, 1950). Earliest collection seen: "Manitoba, plains" (Macoun, 1872). First report: Hill River (old name for that part of the Hayes River between Swampy Lake and the mouth of Fox River) [Bell, 1881; as *Mulgedium pulchellum*]. Basis of the citation of *Mulgedium acuminatum* DC. from Turtle Mountain by Dawson [1875].

Subarctic American: central Alaska and nw. Mack. to n. Man., James Bay, and Que., s. to Calif., N.M., Okla., Mo., Wisc., and Mich.

3. L. SCARIOLA L. Prickly Lettuce

Roadsides and waste ground in the southern part of the province. Northernmost collection: Winnipeg (several collections, the first by Dudley in 1930). Earliest collection seen: the foregoing Dudley specimen from Winnipeg. First report: Lowe [1943].

European: widely naturalized in temperate North America.

Forma *integrifolia* Bogenh. (var. *integrata* (Gren. & Godr.) Nels.; *L. virosa* of Am. auth., not L.), with most of the leaves unlobed, is of common occurrence with the main form in the province.

4. **L. ludoviciana** (Nutt.) Riddell

Specimens have been seen from the following localities: St. Vital, near Winnipeg (Sparling, 1949); Killarney, near Turtle Mountain, alluvial soil by Pembina River (Macoun, 1896); Aweme, about 20 miles southeast of Brandon (Criddle, 1910); Grande Clarière, near Hartney, about 40 miles southwest of Brandon, shaded aspen-oak woods in sandhill area (Scoggan, 1951). First report: Lowe [1943]. Basis of the citation of *L. hirsuta* Muhl. from near Killarney by J. M. Macoun [1897]. Some or all of the Manitoba material may be referable to forma *campestris* (Greene) Fern. (*L. campestris* Greene), with flowers blue or purple from the first.

Temperate western American: Sask. and Man., s. to Ida., Colo., and Tex.; adventive farther eastward.

5. **L. canadensis** L. var. **longifolia** (Michx.) Farw.

Specimens have been seen from the following localities: Whiteshell Forest Reserve, east of Winnipeg (Rook, 1949; Scoggan, 1951, dry granite outcrop); Brokenhead, about 30 miles northeast of Winnipeg (Mosquin, 1952). First report: the present publication. With the following variety, basis of reports of the main form from the province.

Temperate American: B.C. to Calif.; Sask. to Que., s. to Colo., Mo., O., and N.C.

5a. **L. canadensis** var. **latifolia** Ktze.

Specimens have been seen from the following localities: Brokenhead, about 30 miles northeast of Winnipeg, roadside clearing (Scoggan, 1953); Lac du Bonnet, about 50 miles northeast of Winnipeg (Breitung, 1949); Morden, about 60 miles southwest of Winnipeg, thickets by brook (Macoun, 1896). The last-named collection is the basis of the citation of the main form from Morden by J. M. Macoun [1897]. First report: the present publication.

Temperate American: Wash.; Man. to Que., s. to Tex. and n. Fla.

### 51. LYGODESMIA D. Don

1. Pappus light brown; florets and longer phyllaries usually 5; lower leaves 2-10 cm. long, those of the branches reduced and awl-like.............................1. *L. juncea*
1. Pappus white; florets and longer phyllaries usually 8-9; leaves 5-20 cm. long, only the uppermost ones strongly reduced.........................................2. *L. rostrata*

1. **L. juncea** (Pursh) D. Don Skeletonweed

Dry prairie and sandhills in the southern part of the province. Northernmost collection: Rossburn, about 70 miles northwest of Brandon, prairie slope (Scoggan, 1951). Earliest collection seen: Pine Creek, west of Portage la Prairie (Macoun, 1872). First report: Turtle Mountain, open prairie [Dawson, 1875].

Temperate western American: B.C. to s. Man., s. to Ariz., N.M., and Ark.

2. **L. rostrata** Gray

Specimens have been seen from the following localities: Rathwell, about 25 miles southwest of Portage la Prairie, dry sand (de Ruyck, 1943); Glenboro, about 35 miles southeast of Brandon, sandhills (Scoggan, 1951); St. Lazare, about 75 miles northwest of Brandon, sandhills (Scoggan, 1951). First report: Notre Dame de Lourdes, about 30 miles south-southwest of Portage la Prairie [Lowe, 1943].

Temperate western American: Sask. and Man., s. to Colo. and Kans.

### 52. AGOSERIS Raf.

1. Leaves woolly-villous on the often crisped-wavy margins, long-acuminate; achenes beakless.......................................................1. *A. cuspidata*
1. Leaves glabrous, at least in age; achenes short-beaked.
   2. Leaves acuminate, more or less pinnatifid; phyllaries more or less villous, at least on the margins.......................................................2. *A. agrestis*
   2. Leaves acute to acuminate, entire or sparingly lobed or toothed.
      3. Phyllaries glabrous.............................................3. *A. glauca*
      3. Phyllaries villous, at least on the margins...........3a. *A. glauca* var. *dasycephala*

1. **A. cuspidata** (Pursh) Raf. (*Troximon cuspidatum* Pursh; *Nothocalais cuspidata* (Pursh) Greene; *Microseris cuspidata* (Pursh) Schultz-Bip.)

The following specimen is referable here: Souris River south of Brandon, prairie slope (Scoggan, 1950). First report: Jackson *et al.* [1922].

Temperate western American: Mont. to sw. Man., s. to Colo., Okla., Mo., and Wisc.

2. **A. agrestis** Osterh. (Incl. *A. leontodon* Rydb.)

Specimens have been seen from the following localities: Fort Ellice, about 70 miles northwest of Brandon, "dry prairies and open plains" (Macoun, 1879); St. Lazare, about 75 miles northwest of Brandon, sandy prairie (Scoggan, 1953); Victor, west of St. Lazare, dry prairie (Scoggan, 1951). First report: the present publication.

Temperate western American: s. Sask. and s. Man., s. to Mont. and Colo.

3. **A. glauca** (Nutt.) Greene (*Troximon glaucum* Nutt.; incl. *A. parviflora* (Nutt.) Dietr.)

Prairie and meadows in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, dry limestone-gravel ridge and clearings on limestone substratum (Scoggan, 1948). Earliest collection seen: Manitoba, plains (Macoun, 1872). First report: Red River Prairie and near Turtle Mountain [Dawson, 1875; as *Macrorrhyncus glaucus* Torr.].

Temperate western American: B.C. to w. Ont., s. to Wash., Utah, Colo., and S.D.

3a. **A. glauca** var. **dasycephala** Jepson (*A. scorzoneraefolia* (Schrad.) Greene)

Specimens have been seen from the following localities: "Lake Winipeg" (Richardson, presumably 1819–22); Inwood, about 50 miles northeast of Portage la Prairie (Dudley, 1929); Aweme, about 20 miles southeast of Brandon (Criddle, 1926); Brandon, dry hills (Marshall,1946); Killarney, near Turtle Mountain, open prairie (Macoun, 1896); Qu'Appelle River mouth at St. Lazare, about 75 miles northwest of Brandon (Macoun & Herriot, 1906). First report: the present publication.

Temperate western American: B.C. to s. Man., s. to Oreg., Nev., Colo., and S.D.

## 53. CREPIS L.

(Hawk's-beard)

[*See* Babcock, 1947.]

1. Flowering-stems leafy, the leaves narrow and revolute-margined, entire, or the lower ones more or less runcinate-toothed; involucre glandular-pilose; ribs of achenes minutely scabrous.......1. *C. tectorum*
1. Flowering-stems merely bracted or with 1 or 2 small leaves, the leaves chiefly in a basal rosette, lanceolate to narrowly obovate, entire or remotely dentate to runcinate-pinnatifid; ribs of achenes smoothish.
    2. Involucre more or less glandular-pubescent, at least toward the base..2. *C. runcinata*
    2. Involucre not at all glandular.......2a. *C. runcinata* ssp. *glauca*

1. C. TECTORUM L.

Roadsides and waste ground in the southern half of the province. Northernmost collection: Flin Flon (Freedman, 1952). Earliest collection seen: Austin, about 30 miles west of Portage la Prairie (Gilmore, 1922).

First report: near Carberry, railway ballast [Shimek, 1927]. Probable basis of the citation of *C. biennis* L. from near Aweme by Criddle [1927].

Eurasian: naturalized in North America.

2. **C. runcinata** (James) T. & G. (*C. perplexans* Rydb.)

Prairie, meadows, and clearings in the southern third of the province. Northernmost collection: Grand Rapids, near the northwest end of Lake Winnipeg, swampy ground (Scoggan, 1948). Earliest collection seen: Dufferin, near Carman, about 45 miles southwest of Winnipeg, open prairie (Burgess, 1873). First report: Red Deer River and Red River prairie [Macoun, 1884].

Temperate western American: Alta. to Man., s. to Mont., Utah, N.M., and S.D.

2a. **C. runcinata** subsp. **glauca** (Nutt.) Babcock & Stebbins (*C. glauca* (Nutt.) T. & G.)

Specimens have been seen from the following localities: Inwood, about 50 miles northeast of Portage la Prairie (Dudley, 1929); Grand Rapids, near the northwest end of Lake Winnipeg, clearing on limestone substratum (Scoggan, 1948). First report: "Borders of saline lakes and in brackish marshes from Fort Ellice westward..." [Macoun, 1884].

Temperate western American: Sask. and Man., s. to Ariz. and N.M.

### 54. PRENANTHES L.

### (Rattlesnake-root)

1. Involucres hirsute; pappus yellowish to light brown; stem-leaves mostly sessile and clasping........................1. *P. racemosa*
1. Involucre glabrous; at least the lower stem-leaves petioled.
  2. Pappus reddish-brown; heads 8-12-flowered........................2. *P. alba*
  2. Pappus creamy-white; heads 5-6-flowered........................*P. altissima*

1. **P. racemosa** Michx. (*Nabalus racemosus* (Michx.) DC.)

Thickets, prairie, gravel ridges, shores, and clearings in the southern three-quarters of the province. Northernmost collection: Hayes River about 40 miles southwest of York Factory, clay-gravel floodplain of small island (Scoggan, 1949). Earliest collection seen: Turtle Mountain, thickets (Burgess, 1873). First report: Hayes River [Bell, 1881].

(Subarctic-)temperate American: central Alta. to n. Man., James Bay, and e. Que., s. to Colo., S.D., Mo., O., and N.E.

2. **P. alba** L. (*Nabalus albus* (L.) Hook.) White Lettuce. Rattlesnake-root

Thickets, woods, and clearings in the southern third of the province. Northernmost collection: Lake Winnipegosis, portage to Cedar Lake (Scoggan, 1948). Earliest collection seen: Turtle Mountain, thickets (Burgess, 1873). First report: high land east of Red River prairie [Dawson, 1875]. Probable basis of the citation of P. *alata* Gray from near Carberry by Christy [1887], and the listing of *P. altissima* L. (*Nabalus altissimus* (L.) Hook.) by Jackson *et al.* [1922].

(Subarctic-)temperate American: Sask. to s. Ung. and w. Que., s. to S.D., Mo., Tenn., and Ga.

## 55. HIERACIUM L.

### (Hawkweed)

1. Flowering-stems soft, naked or with only 1 or 2 reduced leaves, the leaves chiefly in basal rosettes; heads orange-red, in compact corymbiform cymes; plant developing elongate rooting basal stolons.................................1. *H. aurantiacum*

1. Flowering-stems firm, abundantly leafy; basal rosettes wanting; heads yellow, panicled; plants non-stoloniferous.
   2. Leaves linear to narrowly lanceolate, tapering to base, their margins revolute; involucre glandless.............................................2. *H. umbellatum*
   2. Leaves lanceolate to narrowly ovate, the middle and upper ones rounded to subcordate at base, flat; involucre usually bearing a few glandular hairs......*H. canadense*

1. H. AURANTIACUM L. Devil's Paint-brush. Orange Hawkweed. King-devil

A single specimen has been seen, from St. Vital Park, Winnipeg, where it was collected by Mrs. A. Simpson in 1941. First report: St. Vital Park, Winnipeg [Lowe, 1943].

European: naturalized in eastern North America.

2. **H. umbellatum** L. (*H. scabriusculum* Schwein.)

Thickets, rock outcrops, shores, and clearings in the southern four-fifths of the province. Northernmost collection: Churchill River at mouth of Little Churchill River (Cairnes, 1915). Earliest collection seen: Turtle Mountain, thickets (Burgess, 1873). First report: Hayes River [Bell, 1881; as *H. canadense* var. *umbellatum*]. Basis of reports of *H. canadense* Michx. from the province.

Subarctic circumpolar: Alaska and s. Yukon to n. Man. and James Bay, s. to Oreg., Mont., S.D., and Wisc.; N.B.; Eurasia.

*H. venosum* L., Rattlesnake-weed, Poor Robin's Plantain, with scape naked or with 1-6 scattered leaves, the basal leaves in a rosette, is cited from Red River prairie by Dawson [1875], and is listed by Jackson *et al.* [1922] and Lowe [1943]. No specimens have been seen, however, and it should be excluded from our flora for the present.

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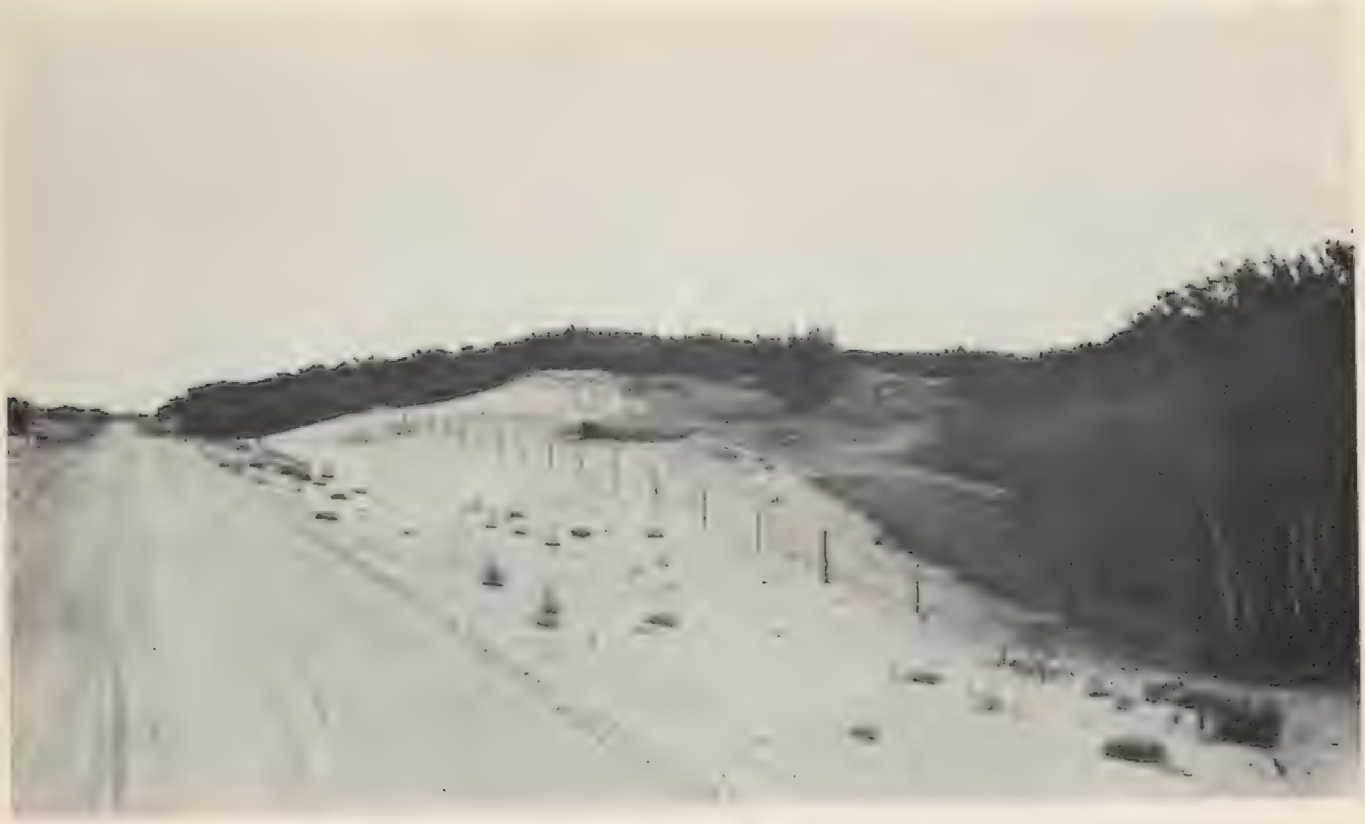
A. Wheat field near Neepawa, about 25 miles north-northeast of Brandon

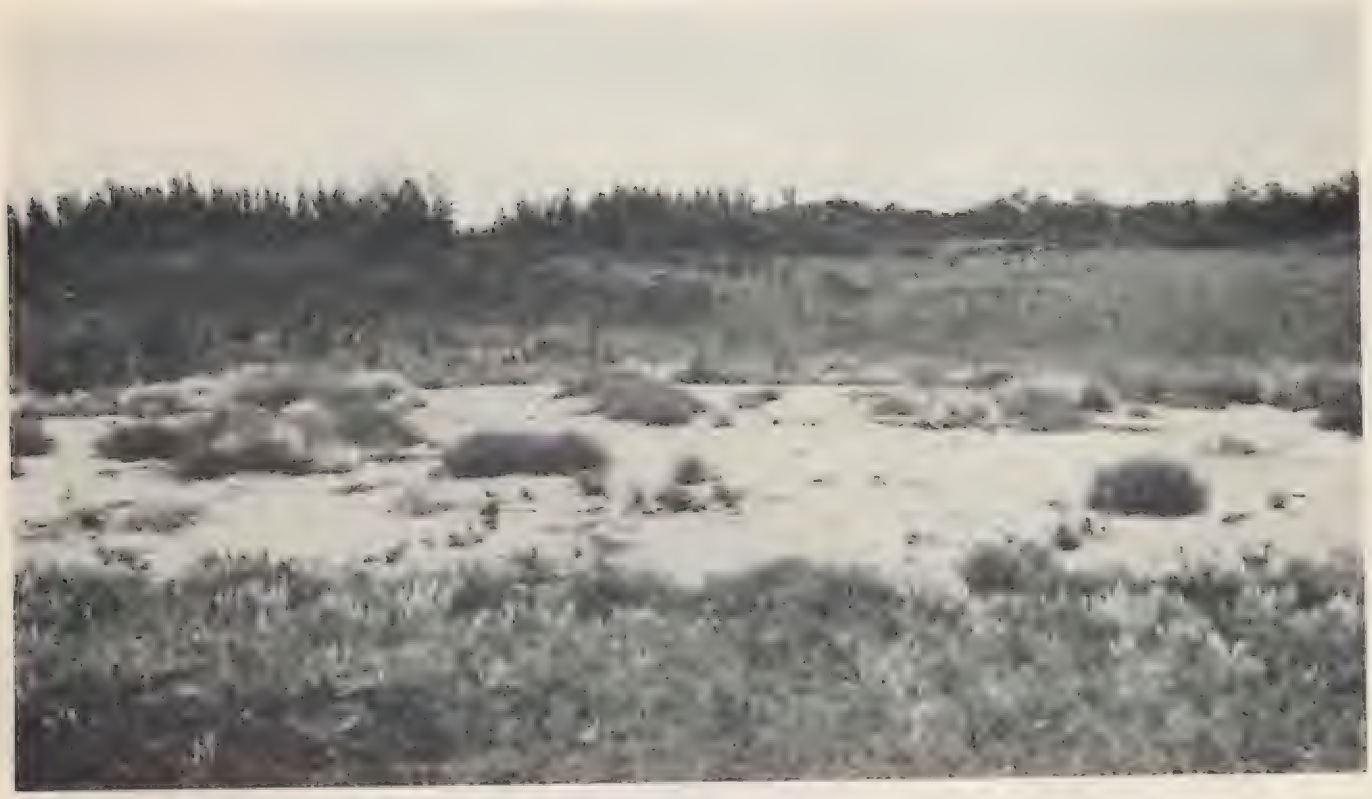
B. Dry prairie at Victor, near the Saskatchewan boundary, about 80 miles northwest of Brandon

A. Assiniboine basin near Oak Lake, about 30 miles west of Brandon, showing typical aspen-parkland landscape

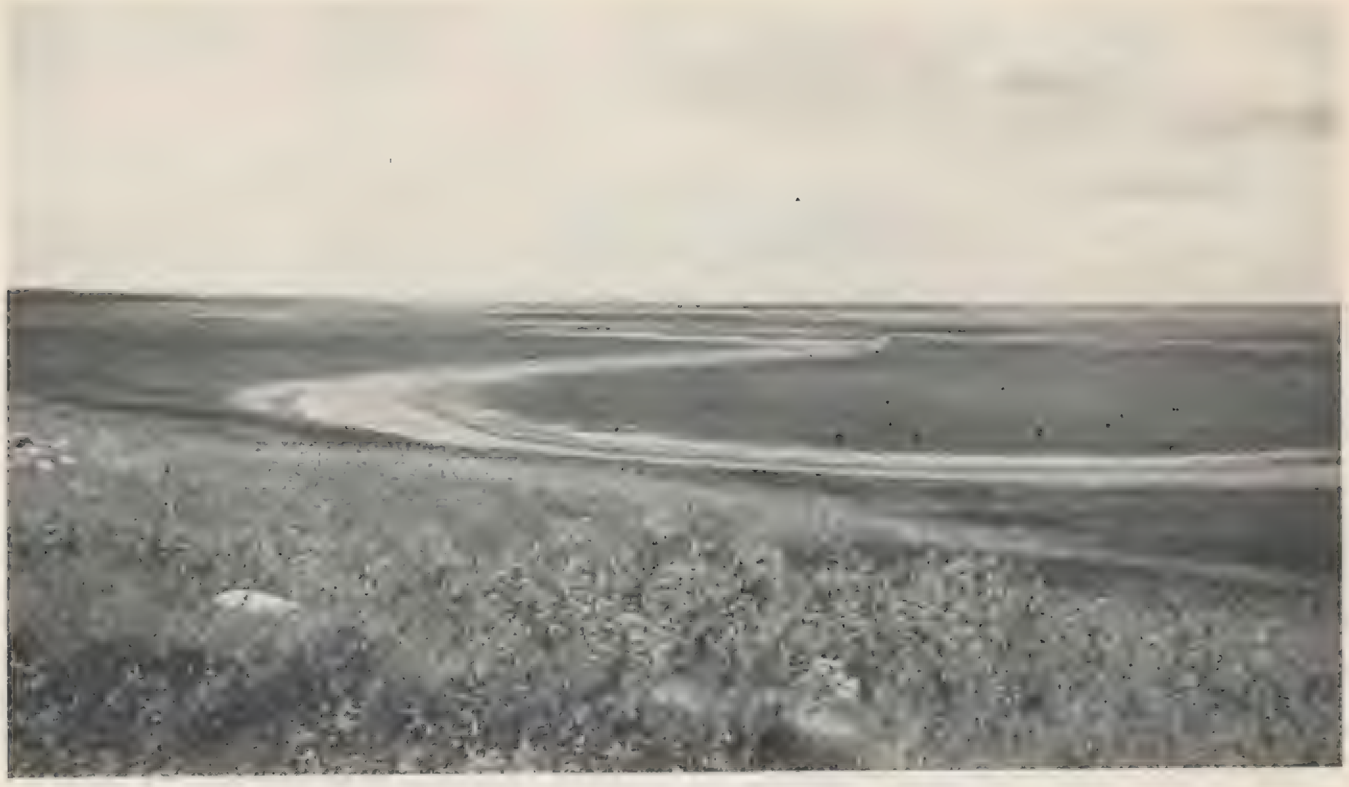
B. Spruce Woods Forest Reserve, southeast of Brandon, showing relict white spruce (*Picea glauca*) on dry, sandy prairie



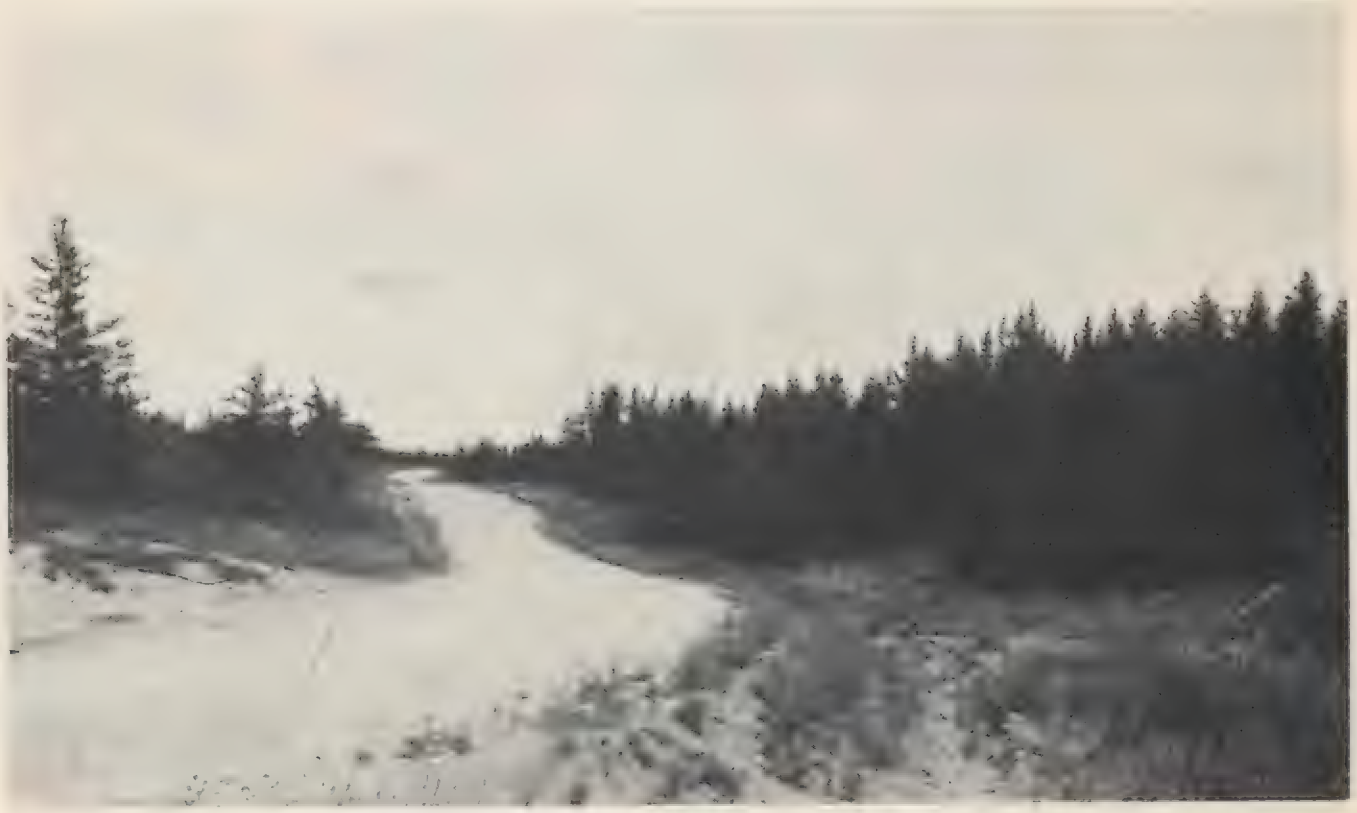
A. Sandhill and dry roadside habitats near Hartney, about 35 miles southwest of Brandon



B. Sandy "blow-out" in dry prairie near St. Lazare, about 75 miles northwest of Brandon



A. Valley of Souris River near Coulter, south of Melita, about 65 miles southwest of Brandon



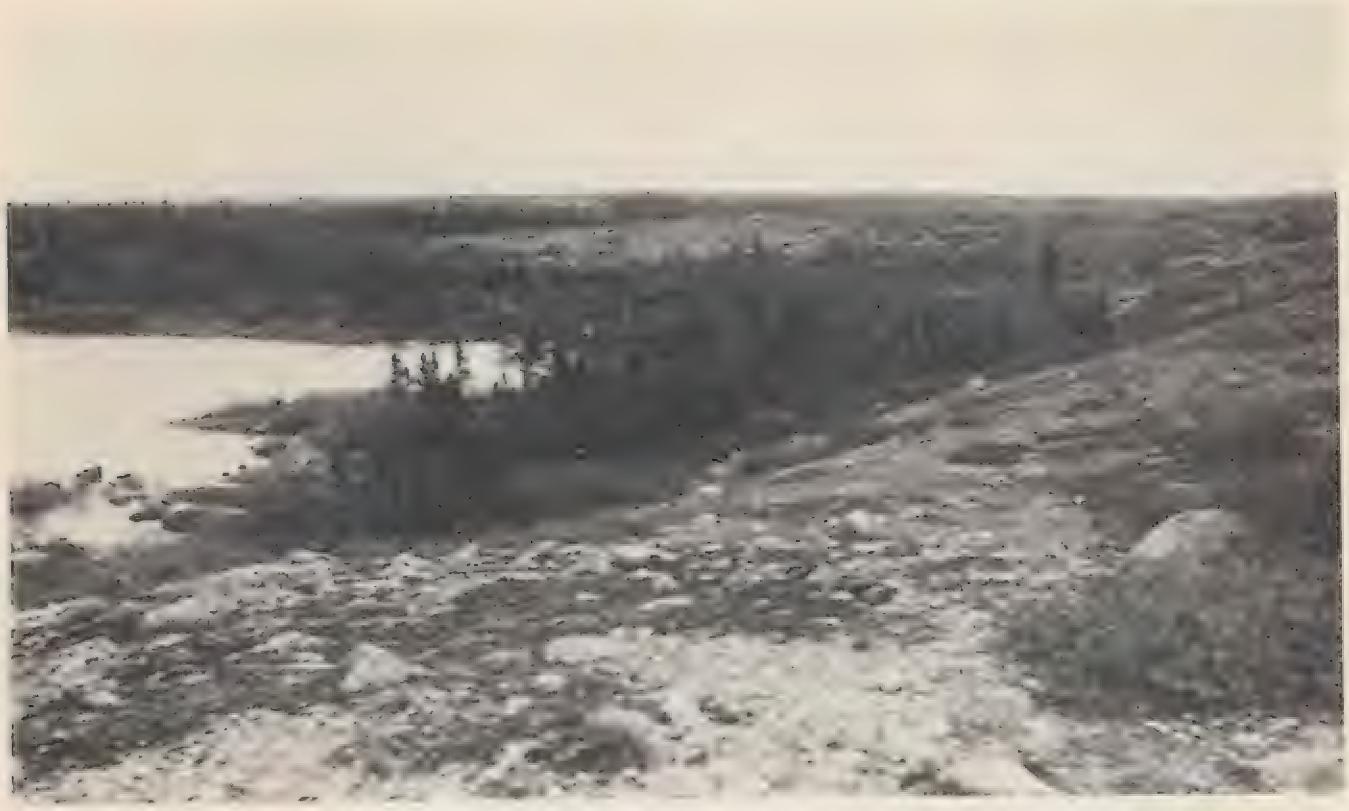
B. Sandilands Forest Reserve, southeast of Winnipeg

A. Hayes River below Knee Lake, about 120 miles southwest of York Factory

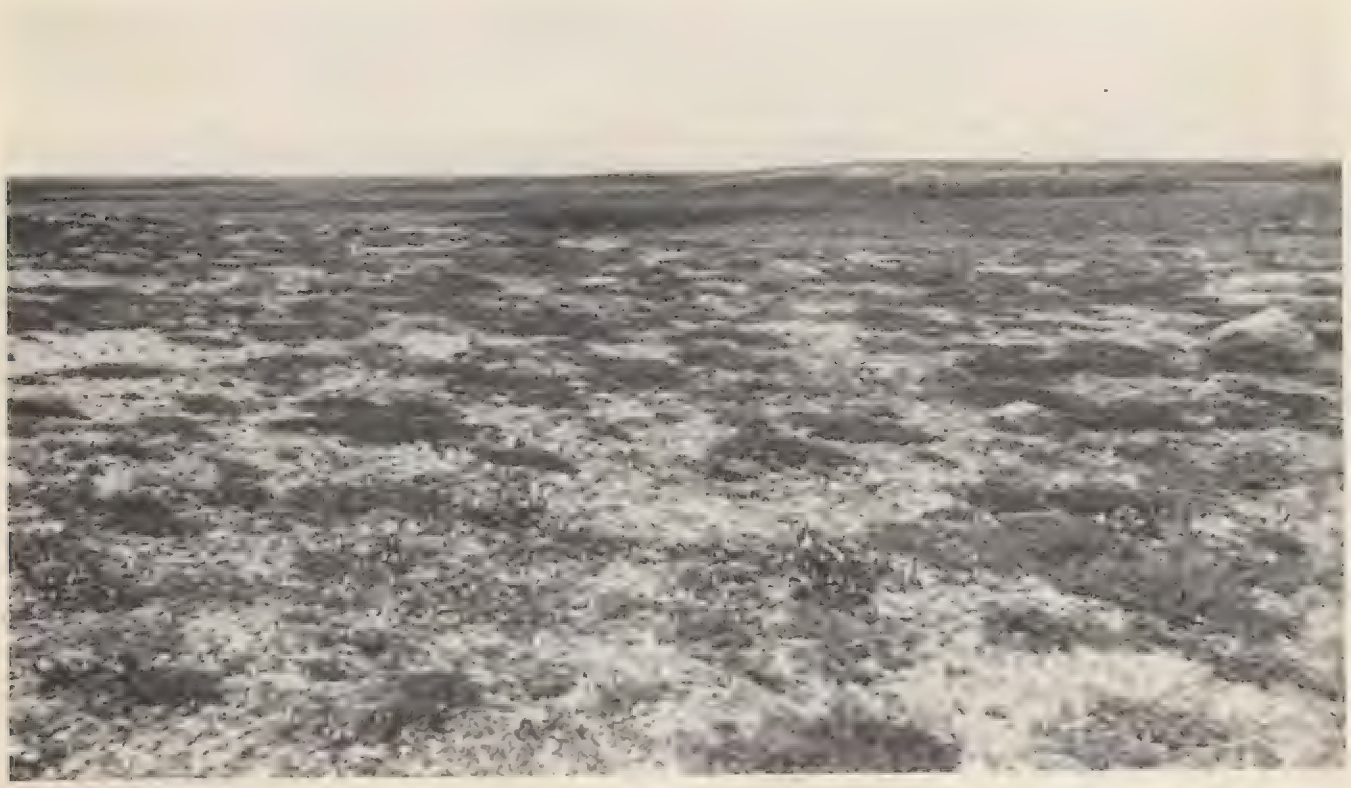
B. Gravel-cobble beach of Nelson River opposite Gillam Island, about 20 miles west-southwest of York Factory

A. Swampy shore of Lake Winnipeg north of Riverton, opposite Hecla Island, about 75 miles north of Winnipeg

B. Salt marsh on Salt Point, Dawson Bay, Lake Winnipegosis



A. Tundra-forest landscape at Nejanilini Lake, lat. 59° 22′ N., long. 97° 46′ W., about 130 miles northwest of Churchill



B. Tundra landscape at Baralzon Lake, lat. 60° 00′ N., long. 98° 10′ W., about 150 miles northwest of Churchill

## Index to Latin Names

Roman type is used for Manitoba plants listed in Systematic Section (pp. 38–573).

*Italic type* is used to indicate synonyms, as well as names of plants not present in the Manitoba Flora, or such as are mentioned only incidentally.

**Bold-face** numerals indicate page on which principal discussion of species is given.

No reference is given in the index to Latin names in that part of the Flora preceding the Systematic Section.

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EDMOND CLOUTIER, C.M.G., O.A., D.S.P.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1957